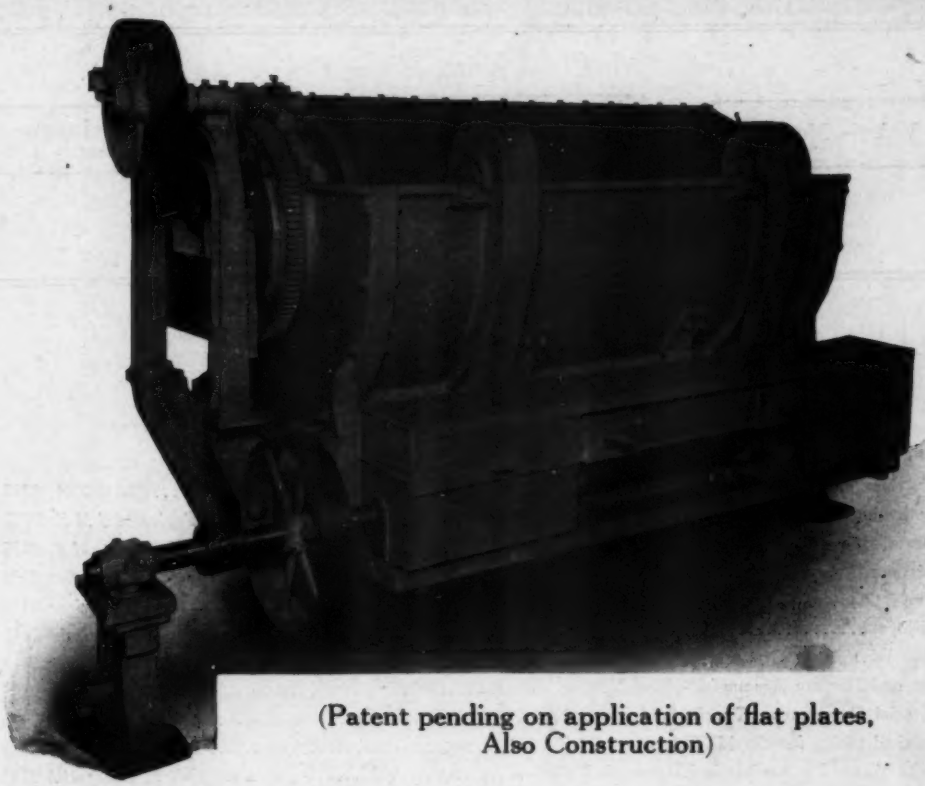

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Vol. 6—No. 12

THE PAPER INDUSTRY

A. SCOTT DOWD
Editor

A MONTHLY EDUCATIONAL JOURNAL
Devoted to the Interests of the Pulp and Paper Industry

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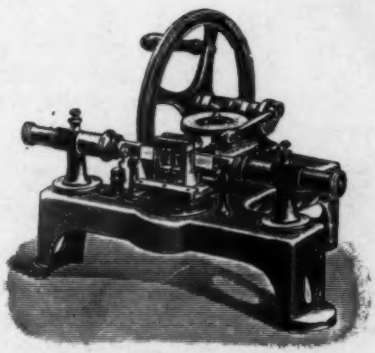

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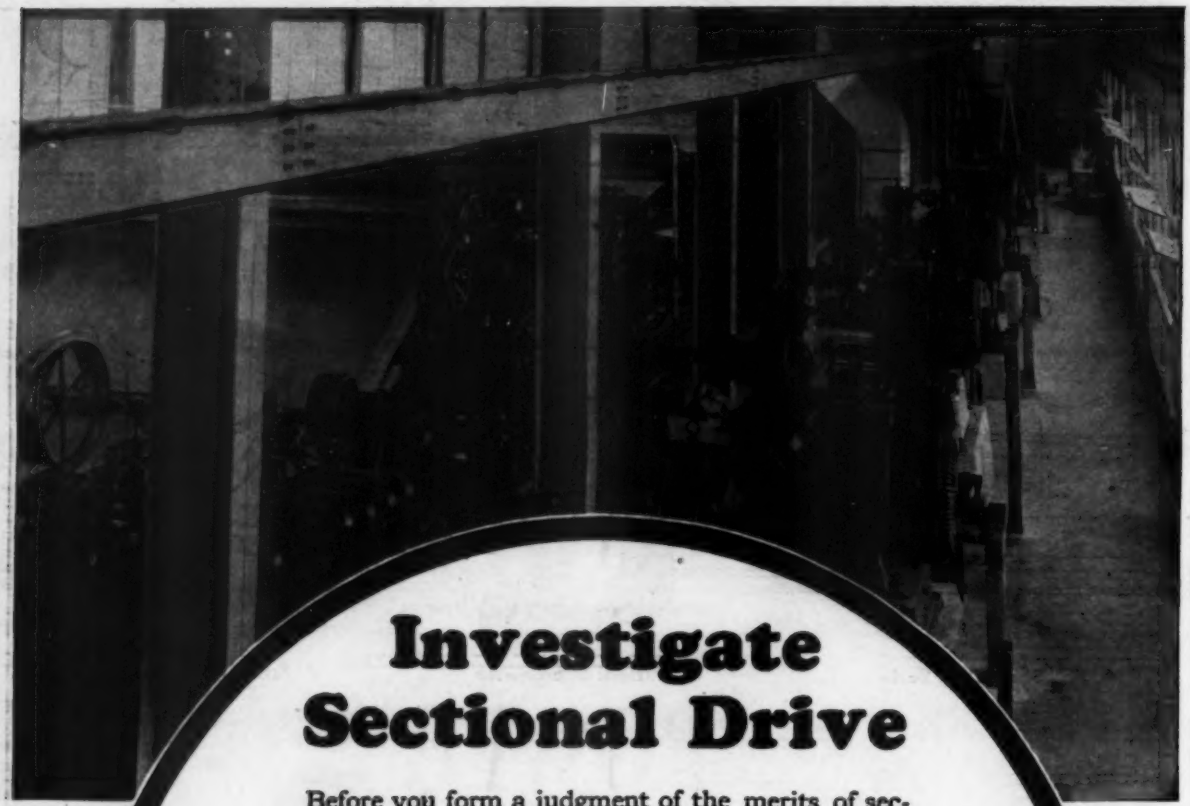

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Before you form a judgment of the merits of sectional paper machine drive, make a careful investigation of the Westinghouse drive.

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are always uniform. The line is a full one and in it are lubricants which will meet the exacting needs of each particular bearing. It is the work of our lubricating engineers, who know these lubricants, to see that each is used in the proper place, the proper quantity and the proper manner.

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It evidences good judgment to avail yourself of this service which we have provided for you. Phone or wire our nearest branch today.

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(INDIANA)
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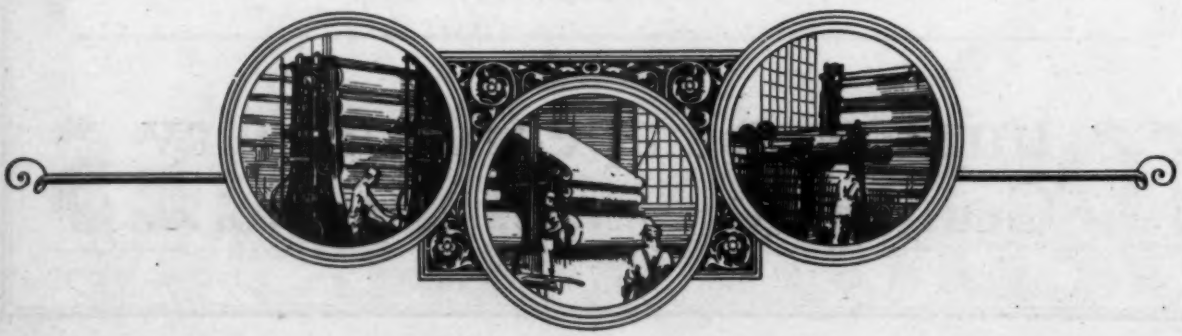

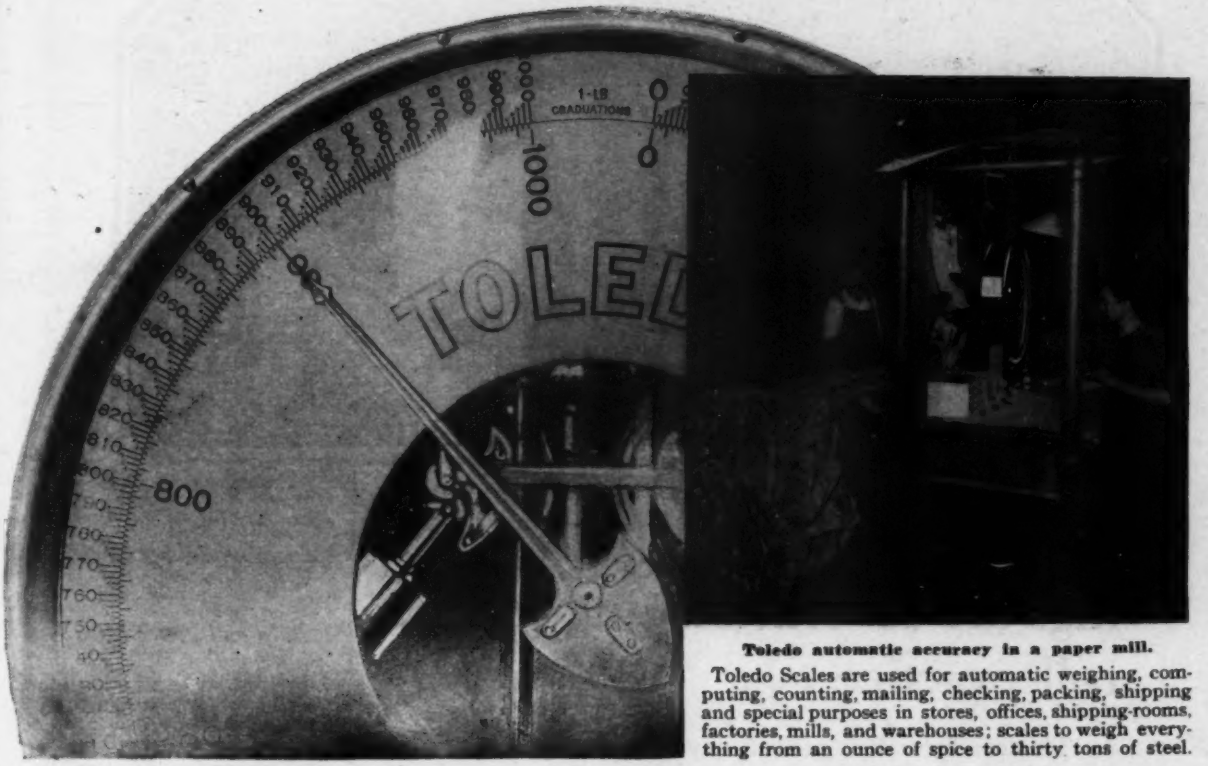

Toledo automatic accuracy in a paper mill.

Toledo Scales are used for automatic weighing, computing, counting, mailing, checking, packing, shipping and special purposes in stores, offices, shipping-rooms, factories, mills, and warehouses; scales to weigh everything from an ounce of spice to thirty tons of steel.

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So successfully is automatic accuracy built into Toledo Scales that wherever they are used the lack of clerical help to handle the important transaction of weighing is no longer a handicap.

Toledo Scales enable the manufacturer of paper and paper products to put *automatic accuracy* into measurement operations at every point in the plant where measurement figures are produced or wanted for production-control or for bookkeeping purposes. They guarantee uniformity to the closest tolerance and safeguard the smallest profit.

The almost unlimited adaptability of Toledo Industrial Scales makes them applicable to intricate measurement and production-control problems.

To modernize your weighing operations the first step is an investigation by Toledo Scale Engineers. This costs you nothing; it may save you much.

Toledo Scale Company, Toledo, Ohio

Canadian Toledo Scale Co., Limited, Windsor, Ont.

Manufacturers of Automatic Scales for Every Purpose

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ESTABLISHED 1870 *Akron, Ohio*

Goodrich

High Speed News RUBBER PRESS ROLLS

"BEST IN THE LONG RUN"

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Goodrich 1788—A belt with less "stretch" for severe drives. Commander Belt: A standard of excellence for general paper mill transmission. "Maxecon" Conveyor Belting—for coal, lapped pulp and wood chips.

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"High Speed News" Press Rolls—Three densities. Rubber Covered Felt Carrier Rolls. Couch Rolls for Fourdrinier and Cylinder Machines. Rubber Covered Breast Rolls, Gumming Rolls, Inking Rolls, Sizing Rolls, Smoothing Rolls, Squeezing Rolls, Waxing Rolls, Wringer Rolls.

"Brown" Water Hose—for paper machine wash-up, bearings, grinders and blow-pits. Goodrich Steam Hose. "Commander" Air Hose. Acid Hose, Boiler Wash-out Hose, Chemical Hose, Oil Hose, Oxyacetylene Welding Hose, Suction Hose, Vacuum Hose, Tubing. Fire Protection Hose.

"Superheat" Asbestos Sheet Packing. "Akron" Red Sheet Packing. Hard Rubber Doctor Blades. Pump Valves, Valve Balls. "High Duty" discs for Globe Valves.

The Hesitant Paper Market

"YES, we have a Hesitant Paper Market with us today!" The various paper trade exchanges tell of "spotty" business. Five mill managers out of every ten say that "business has no pep." Sales managers of various paper corporations testify to the fact that they are working hard but there is no "snap" to business. And yet the volume of general business is large, as is shown by the record carloadings for the month of February.

The steel industry, that indubitable barometer of trade, is doing peak business. The bank clearances are way ahead of those for the corresponding month a year ago. The farmers and producers of foodstuffs have not seen such prices since the war. Wheat vacillating between $1.80 and $2.05—corn up to $1.30 per bushel—hogs up $14.00 per cwt. Transportation in excellent condition—the railroads making money and declaring dividends—plenty of cars—plenty of engines—an open winter—unrestricted traffic—raw materials plentiful at stabilized prices—labor contented—drawing big wages—plenty of work for the majority—and fuel and power in abundance.

"Then, why," says the commodity producer, "should we have a 'spotty, pepless, snapless' market?" The manufacturers are clearly puzzled over the situation. Now there must be a cause for it. We go to the ultimate consumer and ask him these questions:

"Are you using paper?"

"Yes," he answers.

"Are you placing orders for future delivery?" The answer invariably is "No."

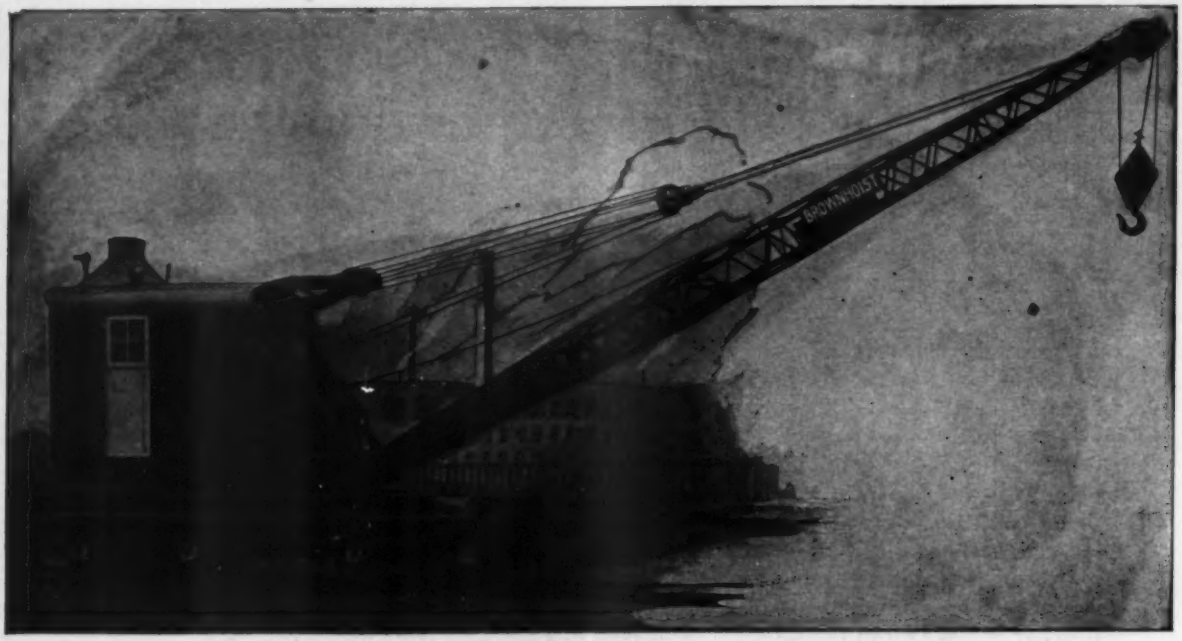
"Then, why don't you place your order for round lots of paper for 30-60 day shipment?" asks the interviewer.

"Because there is no necessity therefor; we can get all the paper we want, at any time we want, at our regular prices." There is the solution of the puzzle! Due to the fact that all consumers of paper are well informed as to the condition surrounding the industry, which information has come to them through the various economic agencies and associations which gather statistics weekly, the buyers of paper know that in every line large stocks of paper are now at the mills. They further know that the transportation conditions are above par; that you can give an order to a jobber or mill today and the goods will be shipped tomorrow or with the least possible delay. What the consumer needs next week, he buys this week; he cuts down the amount of his money invested, makes rapid turn-overs; and is convinced that this is the way in which he should conduct his business. The fact is that the consumers of paper have no stocks, and the jobbers who handle paper, taking their cue from the attitude of the consumers, will not stock up, as they should.

The economic and conservative wave that has swept the country is in full force today. Cut out needless expense; cut off excessive inventories; buy in small amounts but more often is the procedure in the trade today, and it is this condition which is producing what has been called a "Hesitant Paper Market." Buyers and consumers of paper are not hesitant because they fear any slump in prices, are not hesitant about buying larger quantities because they have any fear of price declines, but because they know that supplies are ample and the distribution is rapid.

This situation will obtain in the trade until some new factor, apparent to the consumer of paper, appears—which will jar him out of the rut of "hand to mouth" buying. Will such a factor appear? Any interruption in transportation service, any interference with the present delivery of raw materials, such as pulp from foreign countries, which we are needing badly, will be instantly reflected in the paper situation. Should a lock-out in the pulp and paper industry in Sweden scheduled for the 16th of March, become effective, it would produce an immediately active market in America.

Instead of Hesitant Buyers, we will behold Militant Buyers of Paper! It is a long road that has no turning. The paper industry has now had four years of poor business. A Better Era in the paper business is due now!



Improvements That Assure Bigger Output On This Newest Brownhoist No. 4 Crane

Features

Extra large diameter rotating slip ring.

Very heavy rotating bed and load rollers. The latter are removable from the top, without jacking up the superstructure.

Free running, separately driven drums with outside band clutches.

A high rope hitch on the boom hoisting mechanism.

Boom hoist worm gear runs in oil, making booming with a load practical.

A 150 pound pressure boiler.

The mere announcement of a greatly improved product may not even arouse your curiosity. But when you know that this product is a machine that saves real time and money in thousands of plants, then wouldn't you be interested?

Some of the reasons why the improved No. 4 Brownhoist is a better crane are told here. Always a great favorite because of its speed and dependability, the new model has proved itself even faster, easier to operate, and if possible, more dependable.

We believe this crane will prove of interest to you, and if there is any further information you would like, we will be glad to furnish it.

The Brown Hoisting Machinery Co., *Cleveland, Ohio*

Branch Offices: Chicago, Pittsburgh, New York, New Orleans, San Francisco, London, Eng.

BROWNHOIST

GOOD MATERIAL HANDLING MACHINERY

Legislation and Reforestation

THE illustration herewith well describes what we may expect to have happen in future years if we continue to destroy our forests and do not replant new ones for posterity.

There has been much said and written on the subject of reforestation, and this publication from its inception has advocated to the men in this industry that the one big problem before them was the subject of reforestation—to furnish raw material for the future and for our sons.

Courtesy, The Chicago Tribune

Our Monument

In talking to a prominent lumberman some time ago, the writer suggested that it might be a good plan in this country to have some such law as prevailed in certain European countries where it was necessary when one tree was cut down to plant another to take its place. This man's reply was, "Why pick on us?" or, in other words, he thought it was a good idea but that he should not bear the burden. This seems to be the idea of every one who is using up the present forests; he thinks some one else should plant trees, but why pick on him.

The writer described in an article in our January issue conditions in the South and told of some wonderful possibilities in that section of this country for future lumbering and paper making activities, if proper laws were made today to conserve the timber that is now there and to regrow new timber, but wants once again to point out the absolute necessity for proper laws along the lines of fire protection and land protection.

While in the South, one gentleman said to the writer that the laws in many of the states in that section were written backward. For instance, if one man should have, say, ten thousand acres of land and

Broadcasting-----

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THE American Paper manufacturer is *not* dependent on foreign makers for his supply of cotton Transmission Rope. It is being made in America for his needs by an American manufacturer and it is now running in many paper mills.

The Lambeth Rope, backed by twenty-five years of rope manufacture has all the characteristic qualities of cotton rope for transmission of power.

Its cost is lower.

The American location adds further to the economies. The rapid service we can render is obvious and you can reach us at any time.

Complete drives can be installed for you and expert splicers furnished—all on short notice.

Makers also of Egyptian Cotton Rope for Sheehan Carriers.

We will gladly figure on your requirements.

LAMBETH ROPE CORPORATION

New Bedford **Massachusetts**

and have it nicely fenced in, and his neighbor had a section of land and did not have it fenced at all, this neighbor could allow his cattle or hogs to roam over all of his land, and if they happened to break through the other man's fences and destroyed the young trees on his land, the neighbor would not be liable, as it would be up to the other man to keep his fences intact so that nothing could get through. In the northern states, a land owner must keep his land fenced, or at least cannot allow cattle and hogs to run at large and destroy his neighbor's property. It is stated that the bane of some of the southern land owners is the fact that their neighbors own hogs and these animals roam at will over their owner's property as well as that of other people's, and delight in digging down and eating the roots of young, long leaf pine trees. Therefore, it can easily be seen that there is little chance of growing anything with this kind of condition, and that it really would be useless for anybody to have a plan of reforesting if their neighbor's stock could come in and destroy young trees as fast as they were planted.

The South has tremendous possibilities and if the people of that section and the men in authority will only see that proper laws are passed, this will indeed be a land of promise for the paper manufacturer.

The Liberty Magazine had a very enlightening editorial on this subject February 21, which we believe covers the subject very thoroughly. We reprint it herewith:

"In the days when Theodore Roosevelt was inspiring the thought of American people, the nation began to realize that it was expending some of its basic resources at a ruinous rate. Conspicuous among these resources were our forests and woodlands. Pioneer people on a continent like ours take the forest almost as an enemy. To them it is something to be overcome. It hides their savage foes. It occupies land which the plow would make productive. And, save for the prairies, America was so well wooded that, even when later generations had left behind this feeling of the pioneer with his passion for clearing, they took the forests for granted, while private enterprise exploited them without thought of the future.

"Roosevelt and his group of conservationists awakened the nation to the danger of deforestation. We were told what would happen if the great watersheds were denuded and our timber reserves wiped out. In consequence the Federal government took over forest lands for preservation, many of the states followed, and the problem of reforestation became a conscious concern of the nation's policy.

"But the problem has not been solved. Far from it. Our trees are destroyed four times faster than we are producing them. Twenty years at the present rate of loss will leave us without timber. 'The timber famine,' says the chief of the Federal Bureau of Forestry, Colonel Greeley, 'is no longer a distant and theoretical danger; it is here.'

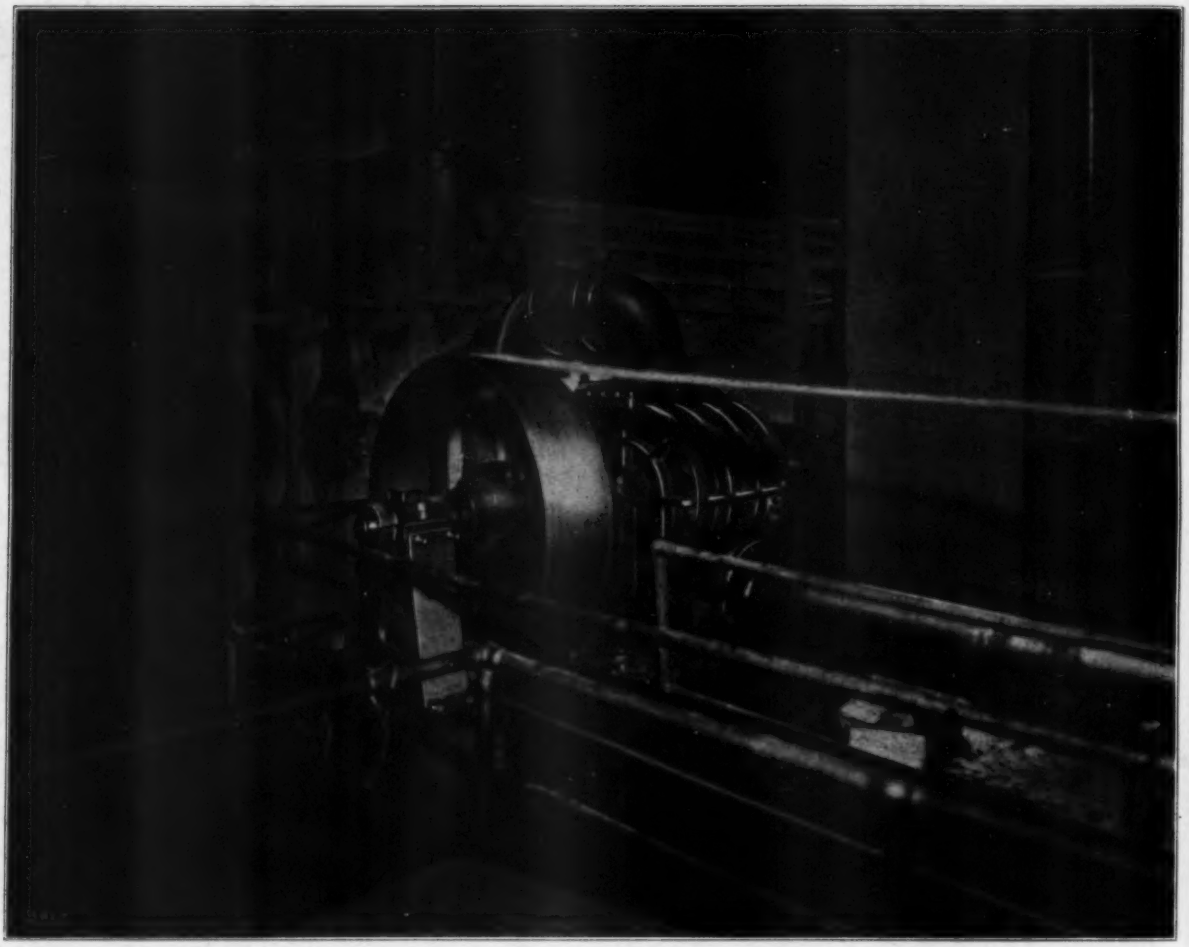
"The country's need is so great and the problem has so many sides that all possible agencies are required to deal with it, both public and private. The Federal government must help. The states must help. Private individuals and associations must help, especially private industry.

"The government, national and state, must help because the vast forests on the mountain ranges and watersheds are necessary to protect the climatic conditions which make the country fertile. This is a duty which cannot be left entirely to private enterprise, which has to consider profits and could not afford perhaps to give them as efficient protection as a public agency from fire hazards and other losses where the forests are remote and not very profitable, though important climatically.

"Yet we must rely largely upon private interest and enterprise for regrowing our vanished or vanishing forests. We must make it worth while to grow trees on lands not suited for crops but capable of bearing trees. By wise tax exemptions and other aid where necessary, the raising of timber may be made profitable to the farmer and other land holders. A good form of long time investment for insurance companies, savings banks, and trustees could be created in timber holdings, properly safeguarded.

"But before ways and means are fixed, a general policy should be laid down assigning to the various agencies relied upon—the Federal government, the states, the lumber and paper industries, farmers and land owners—their respective spheres of action. After this is done the methods of forestation, reforestation, and commercial problems, the problems of production, marketing, and conservation may be taken up, and the financing, economics, and arboriculture, fire and disease protection, etc., can be worked out without confusion within the frame of a comprehensive policy.

"This is a basic problem of the nation, which we cannot afford to neglect, but which solved, as it can be solved, will bring a rich reward to all our people for all time."



Installation at plant of Champion Fibre Co., Canton, N. C.

ROOTS

Rotary Vacuum Pumps for Vacuum Rolls, Flat Suction Boxes, Dryer Rolls and Heating Systems.

Rotary Pumps for water, stock, oil and other liquids.

Rotary Blowers for oil burners, agitation of liquids and pneumatic conveying.

Positive Displacement Meters for air, gases and liquids.

It's a Steady, Economical Performer!

PAPER and Pulp Mill Engineers are naturally interested in a pump that is always ready for service and operates continuously and economically.

The Roots Vacuum pump not only saves in power but saves in repairs. A lifetime of service is not unusual for this equipment.

A most important point for engineers to consider is the fact that there is no wear on the case, as in other pumps, and hence no loss of power due to churning of water.

Write for our illustrated bulletin No. P114 describing this equipment.

The P.H.& F.M. ROOTS CO.
DEPT. 18
CONNERSVILLE, IND.

Chicago Office 128 S. Michigan Ave.
New York Office Room 808-120 Liberty St

What Chemical Control of Bleaching Processes Means to You

NOW that the influence of the chemist is paramount in the production of paper, it is interesting to note the increase in quality and the saving of time and labor.

Experiments under actual working conditions led chemists in paper mills to adopt Liquid Chlorine. The quality of paper hinges directly upon the efficacy of the bleaching process, and chemists proved for themselves the superior action of Liquid Chlorine.

Liquid Chlorine solutions are standard strength, there is 100% bleaching efficiency, and there is a profitable absence of sludge wastes and disagreeable fumes. Also, time sheets show a marked decrease of labor costs, due to ease of handling and perfect control. These conditions give an appreciable boost to plant operations and profits.

Your bleaching processes will show a marked improvement when you use E B G Liquid Chlorine. Now, before you forget it, send for your free copies of "Producing Bleach Liquor with Liquid Chlorine in the Pulp and Paper Mill," and "Transportation of Liquid Chlorine in 15-ton Tank Cars."

CAUSTIC SODA BLEACH

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Electro Bleaching Gas Co.

PIONEER MANUFACTURERS of LIQUID CHLORINE

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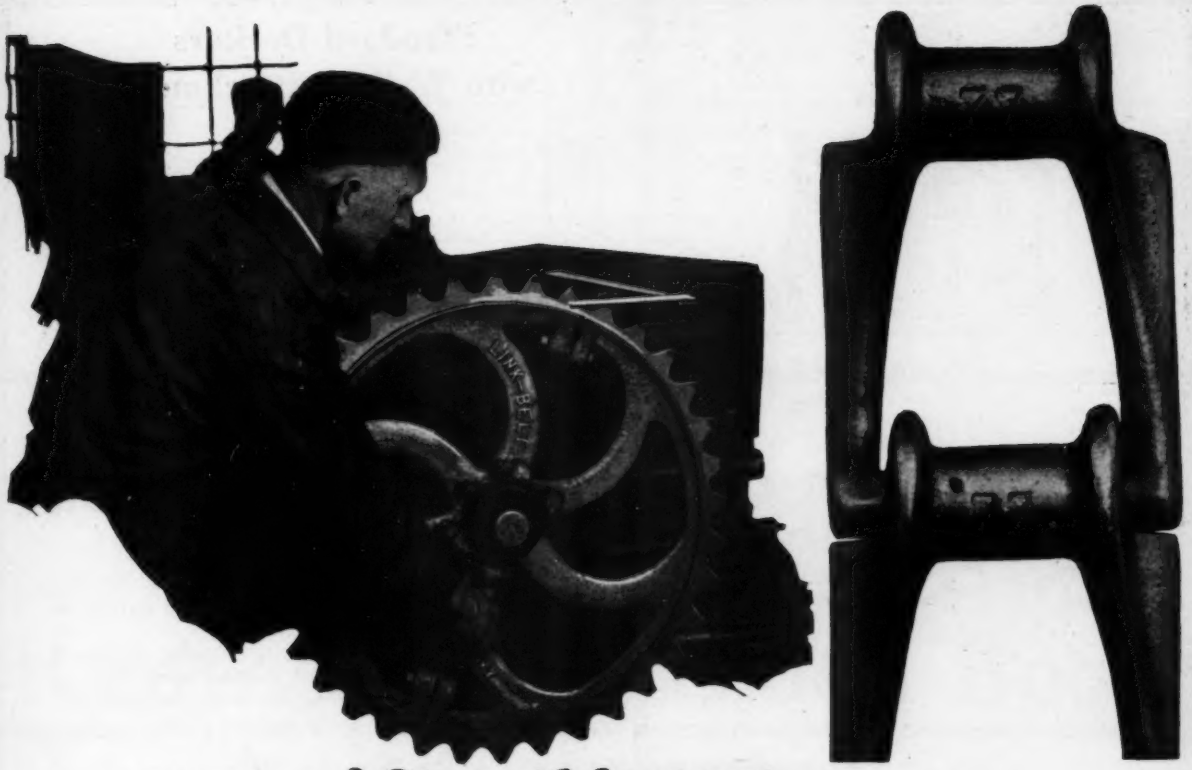
has developed a better roll which will hold the bars in place under the severest service.

The bars can be replaced easier than with any known type of bandless rolls.

Write us for information

THE SHARTLE BROS. MACHINE COMPANY

MIDDLETOWN, OHIO



After this test— Link-Belt Sprockets run true

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Electric Hoists.
Portable Loaders.
Skip Hoists.
Screw Conveyors.
Chain for Every Purpose.
Transmission Machinery.

Send for catalogs.

CHAIN service—and sprocket wheel service—absolutely depend upon the relation of the sprocket wheel to the chain. Mechanically speaking, this means that the wheel must correctly fit the chain to secure long-time, satisfactory service from both.

When you buy poor-fitting wheels and try to *make them run with standard chains you are using,* you're flying in the face of good practice.

Link-Belt Sprocket Wheels are carefully ground to fit the standard chain with which they are to work. After the wheels come to the first inspectors, who test for certain basic points of goodness—the final inspection and test takes place. A skilled mechanic fits the wheel to a chain of standard pitch. If there is the slightest imperfection it is remedied.

This painstaking hand-work guarantees you a product which will make your sprocket and chain money go a longer way. Look for this Trade Mark.

1774

LINK-BELT COMPANY

Leading manufacturers of Elevating, Conveying and Power Transmission Machinery

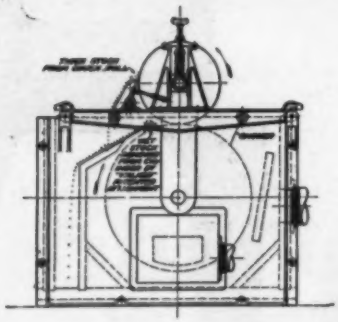
PHILADELPHIA, 2045 Hunting Park Ave. CHICAGO, 300 W. Pershing Road INDIANAPOLIS, 200 S. Belmont Ave.

Offices in Principal Cities

LINK-BELT

THIS YEAR LINK-BELT IS FIFTY YEARS OLD

Chains and Sprocket Wheels



Standard Deckers with Walker Attachment

(Patent Applied For)

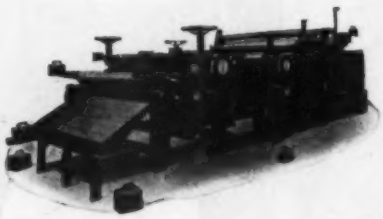
Our Deckers equipped with the Walker Attachment as shown in cut will increase your capacity 50% without requiring additional floor space, power and maintenance.

One firm has ten machines so equipped, which saved the expense of building a new Decker room.

Improvements in couch roll housings offer ready means for regulating consistency of stock.

It is a big advance in Decker design.

Write us today for further particulars.



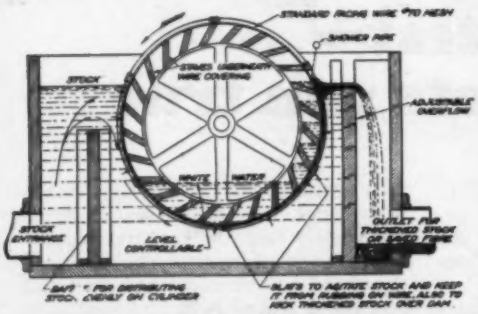
Rogers and Special Wet Machines

IMPROVED AND SIMPLIFIED
SINGLE AND DOUBLE PRESS
FOR CONVERTING CHEMICAL PULP INTO SHEETS 48% DRY

25-35 TONS air-dry pulp per 24 hours. Built in 72" width, with patented pulp weakening and separating device or our new automatic knife cut-off attachment. A real labor saver.

FREIGHT CHARGES are greatly reduced. Savings on this item alone often pay for the machine in one year.

All infringements will be vigorously prosecuted



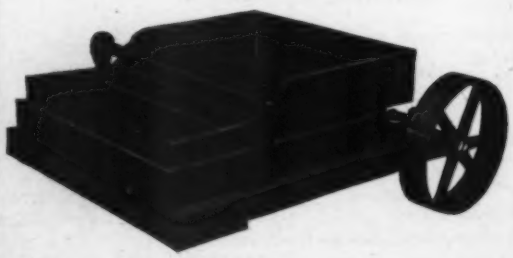
A. D. Wood Machine

Used as Pulp Thickeners, Savealls, Pulp Washers and Water Filters

ADVANTAGES:

Reduced Wire Costs	No Couch Roll
Enormous Capacity	Minimum Repairs
Only 2 H. P. Required	No Doctor
Works Automatically	Requires No Attention

OVER 150 MACHINES SOLD AND IN USE



Wells Undulating Knot and Sliver Screen

Will bear closest investigation from every angle. It separates knots and slivers from all kinds of pulp efficiently, continuously, automatically with negligible cost for operation and upkeep. Simple but rigid construction. Only best materials used. Operation in plain view.

40 TONS DAILY CAPACITY, STANDARD SIZE. WRITE FOR BLUEPRINT AND FURTHER INFORMATION

PULP AND PAPER MILL MACHINERY
GLENS FALLS MACHINE WORKS

GLENS FALLS, NEW YORK

OUR LINE IS MANUFACTURED IN CANADA BY

THE NORTHERN FOUNDRY & MACHINE CO., LTD., SAULT STE. MARIE, ONT.

KENWOOD
WOOL PRODUCTS

Finish and Speed

are two of the limiting factors in board production. BOTH influence ECONOMY. The known results in the rapid removal of water and the high degree of finish secured from the

Kenwood One Sided Board Felt Combination

should interest Board Manufacturers. These results have meant greater production at consequent lower cost.

Because of the fine finish given by Kenwood One Sided Bottoms and Tops, it is feasible under most board conditions to substitute an open Kenwood Press Felt for the usual Plate Felt on both second and third presses. The use of these open press felts with their better water-removal qualities still further speeds up production.

The Kenwood salesman will tell you the possibilities of the complete Kenwood dress for board machines.

F. C. HUYCK & SONS

KENWOOD MILLS, ALBANY, N. Y.

KENWOOD MILLS LTD., ARNPRIOR, ONTARIO, CANADA

Typical Installation of Triple Effect Evaporator Handling Black Liquor in a Large Pulp Mill

Swenson Reclaiming Machinery *for* Soda and Sulphate Mills

If you use the soda or sulphate process, Swenson reclaiming machinery will meet every requirement. Our more than 30 years' experience enables us to render you a real service in solving special problems. Whiting Corporation's complete manufacturing facilities are back of Swenson products.

Submit your evaporator problems to Swenson. Bulletin P-123 on request.

SWENSON EVAPORATOR CO.

(Subsidiary of Whiting Corporation)

Main Office and Works: HARVEY, ILL. (Chicago Suburb)

Our Experiment Station at Ann Arbor is equipped to make tests, on a commercial scale (under the direction of Prof. W. L. Badger) on problems involving evaporation, crystallization, heat transfer, etc., at a moderate charge.

ESTABLISHED 1889

SWENSON

EVAPORATORS – *any capacity for any liquor*
Pulp Mill Machinery – Continuous Crystallizers
Beet Sugar Equipment – Chemical Machinery

AN AFFILIATION OF IMPORTANCE

to Every Industry Depending on Conditioned Air for Successful Operation

EFFECTIVE at once, all work of the Air Conditioning Department of the American Blower Company, Detroit, Michigan, will be handled exclusively by, and contracted through, Drying Systems, Inc., Chicago, Ill.

This arrangement has been made for the sole purpose of better serving our old customers and those industries which depend, for their successful operation, on precise atmospheric conditions. That the affiliation will offer a closer cooperation with manufacturers is assured by the fact that it combines the highly specialized engineering services of one concern with the unusual manufacturing facilities of the other—both of whom are leaders in their respective fields.

The organization of Drying Systems, Inc., which has been engaged in this class of work for a number of years, is now augmented by several experts from the American Blower Company, who are specialists in various lines of Air Conditioning Engineering. Sirocco equipment, manufactured by the American Blower Company, and recognized as standard throughout the industrial world, will be used exclusively on all installations.

The advantages of design and service, offered by this logical affiliation, will justify investigation for any Air Conditioning problem. All details have been perfected so that your requirements will receive immediate attention.

AMERICAN BLOWER CO.
Detroit, Mich.

DRYING SYSTEMS, INC.
Chicago, Ill.

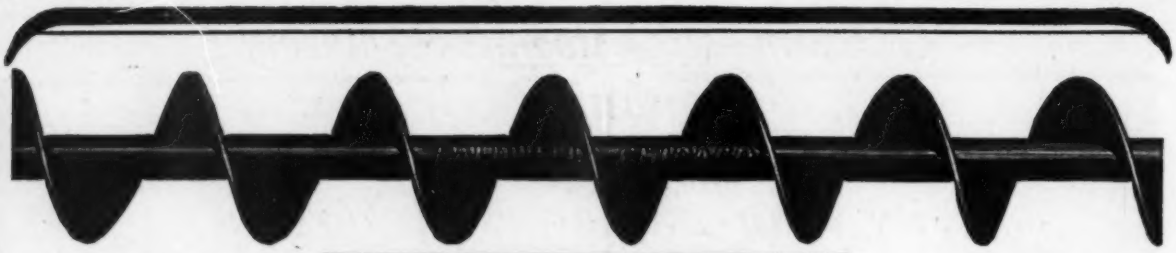
YEARS of highly specialized engineering effort have been intensively applied to make INDUSTRIAL locomotive cranes outstandingly superior. Executives who buy on a quality basis recognize in INDUSTRIAL superiority of design, workmanship, material and performance, the signs which distinguish the exceptional from the merely good.
INDUSTRIAL WORKS
BAY CITY MICHIGAN
INDUSTRIAL
LOCOMOTIVE CRANES

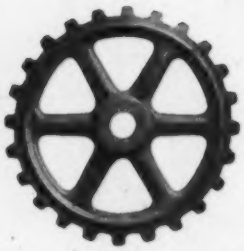
"Gypsum—with its mass of closely knit, air confining cells—has a lower coefficient of conductivity than any other fireproof structural material known"

THIS scientific fact explains why Pyrobar gypsum decks are enabling paper mills to check roof sweating and so cut air conditioning expense. * * * There is a type of Pyrofill (poured-in-place) or Pyrobar (precast tile) to suit every roof design. They are low in cost, quickly erected and permanent. * * * Write for booklet containing up-to-the-minute data on roof design and insulation.

UNITED STATES GYPSUM CO.
General Offices: Dept. D
205 West Monroe Street, Chicago, Illinois

141,483 sq. ft. Pyrofill Monolithic Roof were used on this building





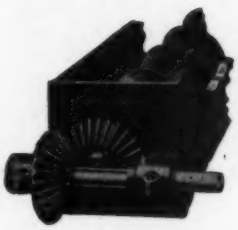
CALDWELL VALUE

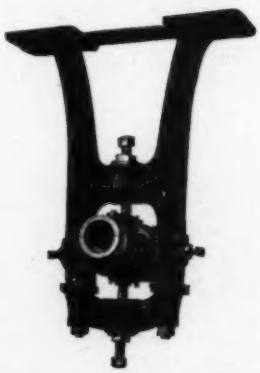
THE real worth—or value—of an article is predetermined by the ideals of the maker. It is in the doing of small things well that we find the final secret of quality.

Users of Caldwell products have never questioned the presence of superior value (quality) in this equipment. Once used they know this value for what it is. Self interest prompts them to continue specifying Caldwell products over long spans of years.

If you need elevating, conveying or transmission machinery promptly, address Caldwell or the nearest Link-Belt office.

H. W. CALDWELL & SON CO.
LINK-BELT COMPANY, OWNER
Chicago: 1700 S. Western Ave.
New York: 2675 Woolworth Bldg.
Dallas, Texas: 810 Main St.
Link-Belt Company Offices in Principal Cities





Caldwell Line
Power Transmission Machinery.
Bearings.
Shafting.
Pulleys.
Machine Molded Gears.
Cut Gears.
Rope Drives.
Chains, Wheels, Buckets

Caldwell Line
Elevating and Conveying Machinery.
Helicoid Conveyor and Accessories.
Belt Conveyors.
Chain Conveyors.
Elevator Buckets.
Boots and Casings.
Catalogs on request.

C-28

CALDWELL

No Ordinary Name

GMC is a truck name you can depend on. It identifies a quality truck that does better work a lot longer.

It identifies advanced features of truck design that can't help but produce the superior GMC performance.

The GMC name also points to superior resources behind these trucks. Resources of which these are a specific few:

Experience—since the beginning of the truck industry. Experiment—development of extra-sturdy materials and parts in General Motors Research Laboratories. Economy—a share in the purchasing power of General Motors—better materials at the cost of ordinary materials purchased in smaller quantities.

GMC is no ordinary name because GMC is no ordinary truck—and because powerful resources are on the job to keep it so.

Ask for the new GMC booklet on motor truck operation and care.

GMC

General Motors Trucks

GENERAL MOTORS TRUCK COMPANY
Division of General Motors Corporation
PONTIAC, MICHIGAN

CLIP AND MAIL

General Motors Truck Co.,
Dept. 61,
Pontiac, Mich.
Send me the GMC booklet.

Name .....

Business .....

Address .....

THE HARRINGTON STOKER

An Example You Can Safely Follow

Based on previous experience, repeat orders, or upon results of careful investigation, engineers of the following nationally known concerns have installed Harrington Traveling Grate Stokers.

Certainly you can safely follow the example of these leaders of American industry in choosing the Harrington Stoker to solve your fuel burning problem.

The Sorg Paper Co., Middletown, O.
Consolidated Gas Co. of New Jersey, Long Branch
Steel & Tube Company of America, Mayville, Wis.
Carnegie Steel Company, Rankin, Pa., and Mingo Junc., O.
Bunte Brothers Candy Company, Chicago, Ill.
Cleveland Elec. Illuminating Company, Cleveland, O.
Chicago By-Prod. Coke Corp., Chicago, Ill.
New York State Gas and Electric Co., Ithaca, N. Y.
American Steel & Wire Co., Waukegan, Ill.
American Can Company, Maywood, Ill., and Joliet, Ill.
American Sheet & Tin Plate Co., Elwood, Ill., and Wellsville, O.
National Biscuit Company, St. Joseph, Mo., and New York City
Northern Pacific R.R. Co., Glendive, Livingston, Mont., and Brainerd, Minn.
New York Central Railroad Co., New York, N. Y.
United Alloy Steel Corporation, Canton, O.
Colonial Salt Company, Akron, O.
U. S. Gypsum Company, Fort Dodge, Iowa
Western Electric Co., Jamestown, North Dakota
Wadsworth Salt Co., Wadsworth, Ohio
West Virginia Pulp and Paper Co., Mechanicsville, N. Y., and Luke, Md.
Waterways Paper Products Co., Chicago, Ill.

Riley Stoker Corporation

RILEY STOKER CORPORATION

"RILEY" Underfeed Stokers — *"JONES"* Underfeed Stokers — *"HARRINGTON"* Traveling Grate Stokers

"MURPHY" Automatic Furnaces — Pulverized Coal Installations

9 Neponset Street, WORCESTER, MASS., U. S. A.

BOSTON NEW YORK PHILADELPHIA PITTSBURGH BUFFALO CLEVELAND DETROIT
CINCINNATI CHICAGO ST PAUL KANSAS CITY DENVER CHARLOTTE DALLAS

Riley Engineering and Supply Co., Ltd., Toronto — Riley Stoker Co., Ltd., London

$180 PER YEAR

THIS is what it has cost the Meriden Electric Light Company, Meriden, Conn., to keep the Terry illustrated below in efficient operation for twenty years. The Assistant Engineer writes as follows about this machine:

"This turbine was purchased twenty years ago to drive an exciter. Owing to plant growth, in 1917 it became too small for this service and was connected to our condenser priming pump. It is run at least once every day without the least attention. The only repair parts that have been supplied are one set of glands—cost $36.00."

This is another example of the long life and low maintenance cost of Terry turbines. Of course, not every Terry turbine will perform in the same manner, but every Terry turbine, with the same care and attention, will deliver the same satisfaction. This is because of the uniformity of product made possible by the rigid inspection of parts made to measure within very close limits.

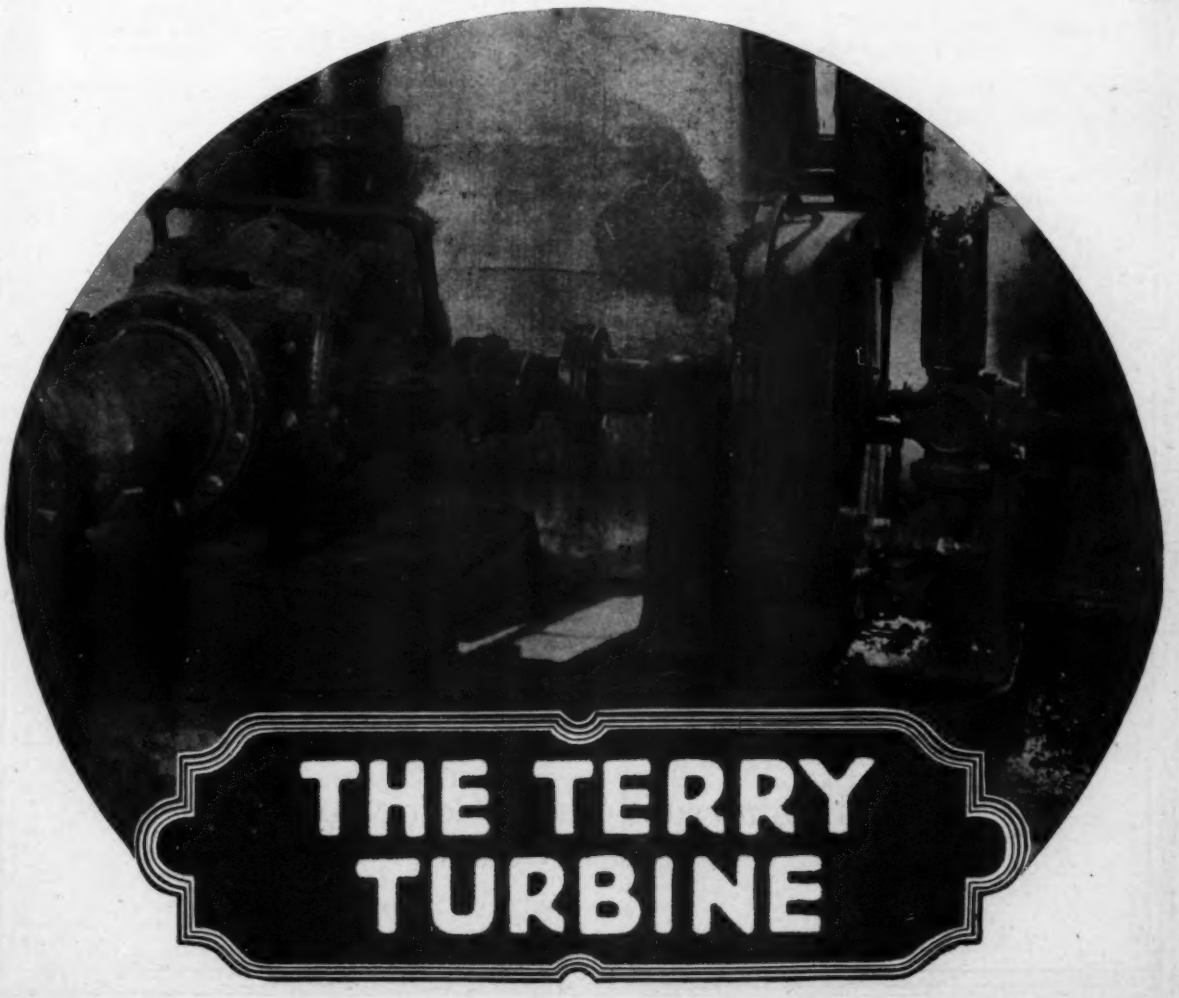
Terry turbines are constructed in all sizes up to 1500 horse power and for all steam conditions. Let a Terry engineer furnish you with complete data for your particular needs.

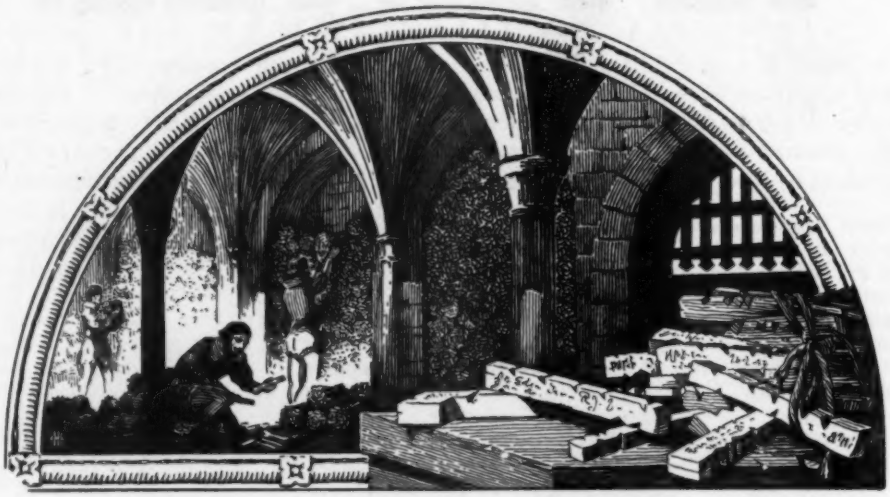
THE TERRY STEAM TURBINE COMPANY

Terry Square, Hartford, Conn.

Offices in Principal Cities in the U. S. A.
Also in Important Industrial Foreign Countries

T-933





"Ledger 45, Folio 137"

Not more than half a dozen words are needed for the modern accountant to locate the state of any account on his books. But imagine what the Cashier of the Bank of England had to wrestle with when George Washington was still a British subject. Notched twigs recorded thousands of important financial transactions. A needle in a hay stack was little harder to locate than any particular twig in the vaults of the Bank of England.

Finally, these twigs became such a nuisance that they were ordered burned, and the resultant blaze burned down the Parliament buildings. Yet even that calamity was repaid with a system of records among the most thorough in the world. When the "Old Lady of Threadneedle Street" was able to replace sticks of wood with ledger paper, a new era of book-keeping began.

Hammermill Paper Company

Erie, Pennsylvania

SYMBOL of QUALITY
KALBFLEISCH CHEMICALS
FOR NEARLY A CENTURY

Chemicals *for* Paper Mills

ENGLISH CHINA CLAY

Coating ~ Filler

Best grades **Uniform quality** **Frequent deliveries**

THE KALBFLEISCH CORPORATION
200 FIFTH AVENUE, NEW YORK

Factories: ERIE, PENNSYLVANIA
BROOKLYN, NEW YORK
KALAMAZOO, MICHIGAN
ELIZABETH, NEW JERSEY
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High Grade
Coated Book
and
Coated
Lithograph
Paper

WATERVLIET PAPER CO.
MANUFACTURERS
COATED — BOOK PAPERS
WATERVLIET, — MICHIGAN

KVP

Papers:

Genuine Vegetable Parchment
For wrapping all moist and greasy foodstuffs.

Bread Wraps—Waxed Papers
For tight-sealing cartons and wrapping dry foods.

Bond and Ledger Papers
All standard sizes, weights and colors.

Handy Household Papers in Rolls
Ask and ye shall receive full information.

KALAMAZOO VEGETABLE PARCHMENT CO.
Manufacturers of
PARCHMENT, WAXED — BOND PAPERS

KALAMAZOO, MICHIGAN
Where Quality is the watchword

Unusually DEPENDABLE

LUNKENHEIMER "CLIP" GATE VALVES

The choice of thousands of discriminating valve users for steam, oil, water, gas or air service, where pressure does not exceed 100 pounds.

Capable of withstanding not only the pressure and temperature for which they are recommended, but also the stresses caused by expansion, contraction, vibration, weight and settling of the pipe, and other severe service conditions.

Simplicity of design, sturdy construction, easy accessibility, and renewability of all parts, are factors which contribute to the wide popularity of Lunkenheimer "Clip" Gate Valves.

Regularly furnished in Iron Body Bronze Mounted pattern; but also procurable with lever for Quick Operating purposes, and in the "All-Iron" pattern for handling fluids which attack alloys of copper.

Detailed description in booklet 505; a copy will be sent on request.

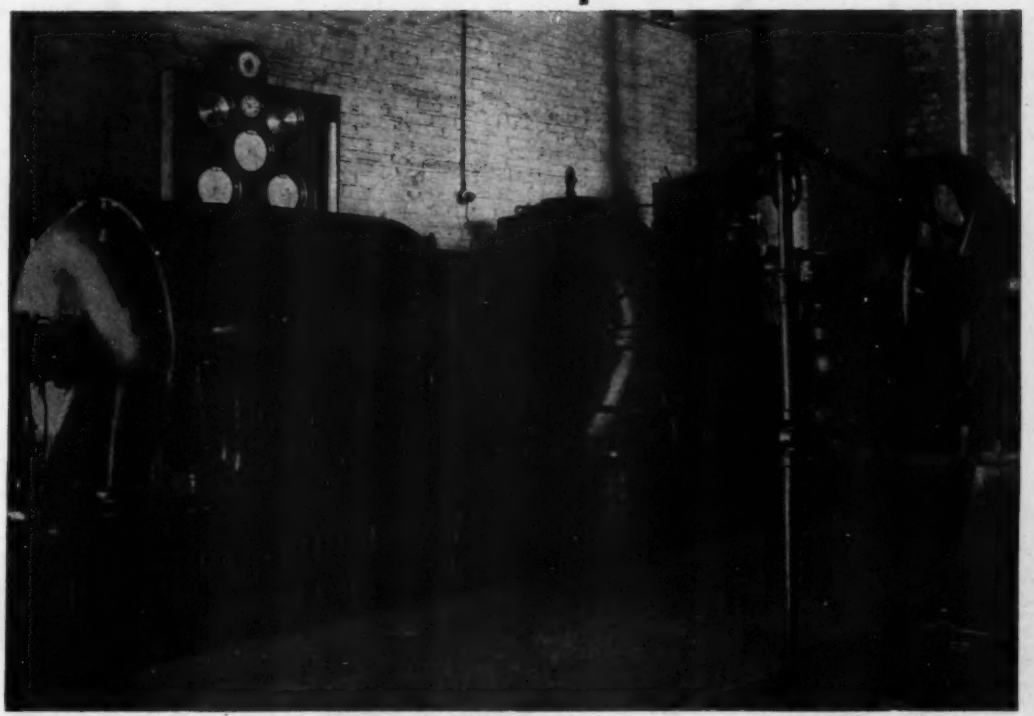
THE LUNKENHEIMER CO.
"QUALITY"
New York Chicago CINCINNATI, O., U. S. A. Boston London
Export Dept. 125-135 LaFayette St., New York

EASY TO DISASSEMBLE EASY TO REASSEMBLE

"America's Best since 1862"

5-23-67

"We used to blow the steam up in the air—now we pull the whole plant with it!"



Normally the exhaust from the mine hoisting engines supply ample steam for operating the turbine. When a deficiency occurs, it is automatically made up by live steam from the boilers. Consequently The Toluca Coal Co. is literally obtaining power as a by-product.

Thus writes the Toluca Coal Co.—

"There were a couple of prospective buyers of yours here from Kansas City, a while back, asking all kinds of questions. Of course we gave the outfit a fine recommendation. They came back later and asked Zeke about the efficiency, and so forth. Zeke told them that it was all efficiency, as we used to blow that steam up in the air and now we pull the whole plant with it. Not bad, at that, do you think? He said they seemed well pleased at that."

Are *you* wasting exhaust? Turn it into power with a Kerr Mixed Pressure Turbine. Ask us about it.

ELLIOTT COMPANY

Executive Office,
Pittsburgh, Pa.
Turbine Sales Dept.,
Wellsville, N. Y.
Branch Offices and Representatives in Principal Cities.

Products: Turbines, Condensers, Air Ejectors, Deaerators, Heaters, Strainers, Separators, Grease Extractors, Filters, Automatic Valves, Blow-off Valves.

H-453

For Economy

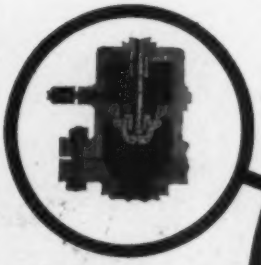
KERR

Mixed Pressure TURBINE

Eliminate Condensate

Labor Saving in Operation

Venturi Nozzles Assure Maximum Velocity of Steam

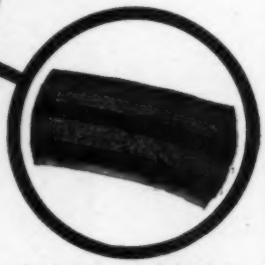


Superior Valve Construction

Here are some of the reasons for the efficiency of Diamond "Valv-in-Head" Soot Blowers

Saving in Steam Required for Operation

Steel Bearings



Calorized Metal Assures Long Life of Elements

Floating Feature No Binding

Gear Reduction Assures Proper Speed of Rotation

Quick or Slow Opening of Valve Controlled by Trigger

Patent Notice! Soot Blowers having automatically operated valves were originated, developed and commercially introduced by us, and are covered by Patents issued and pending. Infringements of these patents will be prosecuted.

DIAMOND POWER SPECIALTY CORPORATION

DETROIT, MICHIGAN

This man is doing one of the jobs in connection with cleaning a boiler that you have to pay for. And the cost of a cold boiler plus more labor and materials is also on the bill. Yet you can save it all. Read how others have done it

How a New York manufacturer eliminated boiler cleaning

IN THE town of Elmira, New York, there is a manufacturing plant that operates two Erie City boilers of 125 H. P. each, ten hours a day. Feed water for the boilers comes from a private well containing 18 grains hardness per gallon.

This water was more than hard enough to cause the chief engineer trouble and increase the operating cost of his boiler room. To begin with, his boilers had to be cleaned every three weeks, for by that time the scale would average one-eighth of an inch in thickness. Furthermore, the ends of the flues had to be rolled frequently.

The insulating effect of the scale caused a lot of fuel to be wasted. It was continuously burning out a number of tubes which had to be replaced at considerable expense.

This state of affairs continued until late in 1918, when the management decided it would be a wise move to rid their water of the hardness that was causing all the trouble. Accordingly, The Permutit Company, largest water conditioning specialists in the world, were consulted. Upon their advice a Permutit Water Softener was installed early in 1919 that delivered 12,000 gallons of absolutely soft water in 12 hours for their boiler makeup water.

What the Permutit Softener accomplished toward improving conditions in the boiler room of this plant can best be told in the words of the treasurer of the company, as expressed in a recent letter to us:

> "Inasmuch as this system has been so satisfactory we are very glad indeed to pass on our opinion regarding it. Previous to its installation, we were continually having boiler makers at the plant to roll the ends of the flues, etc., and it was necessary very frequently to clean the boilers of the heavy scale deposits which would accumulate—notwithstanding our constant use of various well-known boiler compounds supposed to take care of this condition.
>
> "Since the installation the boilers have been entirely free from this scale, the system working at all times without any half-way results. We might also say that the system itself is so simply operated that we do not have to give it any extraordinary attention, as it is easily operated by our regular engineer."

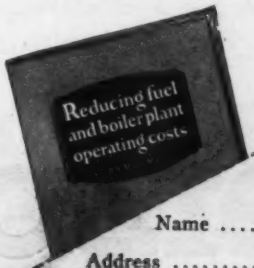
The experience of this New York State boiler plant is a common one. Wherever Permutit Water Softeners are used, in hundreds of boiler plants all over the country, maintenance expenses are reduced and operating troubles are cut down.

How about your own plant? Do you have to clean boilers, replace tubes, and make repairs for which hard-water scale is responsible? Don't let that condition continue. No matter whether you operate a little 50 H. P. heating plant or a large central station, there is a type of Permutit Equipment to care for your needs. It will pay you to know more about this subject of water supply—to hear what other plants have done and learn what you can do too.

Send for a free copy of our booklet, "Reducing Fuel and Boiler Plant Operating Costs." There is no obligation and it contains information that is extremely valuable to an engineer. Just sign and return the coupon below—today.

The Permutit Company
440 Fourth Ave. New York

This coupon will bring you a booklet that is full of practical, interesting information on the subject of boiler room water supply. It will add to the knowledge and equipment of any engineer.



The Permutit Company
440 Fourth Ave.
New York

Please send me your free booklet, "REDUCING FUEL AND BOILER PLANT OPERATING COSTS."

Name .....

Address .....

City ..... State.....

THE Permutit Company are the largest specialists in water conditioning, the only firm that makes all types of water treating equipment, including both rapid and slow regenerating softeners.

Zeolite water softeners were introduced and developed in the United States by the Permutit Company, and today their installations cover every state in the Union, and every county in many states.

A special research laboratory and staff are maintained for solving the technical problems that arise in connection with industrial water softening. No plant is so large or so small but there is a Permutit apparatus to fit its needs.

Small Air Compressors

Small in Size Only—

Each of these smaller compressors typifies the "big" points of Ingersoll-Rand construction, materials and service.

These small machines will give you *compressed air at a lower cost per day*—because they operate steadily and efficiently with the least necessary attendance.

Class "ER" horizontal compressors are built for discharge pressures up to 150 lbs. Sizes deliver from 28 to 386 cu. ft. per minute at 100 lbs. per sq. in. pressure.

Type Fifteen Compressors are vertical single-acting machines. Sizes for 100 lbs. per sq. in. pressure range from 7 to 23 cu. ft. per minute.

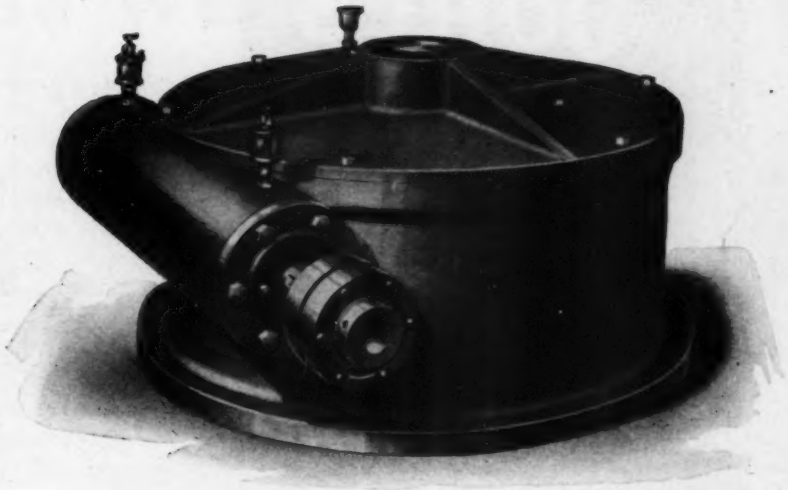
Send for Bulletin 3050 and 3045. These tell the whole story—details of construction, dimensions, etc.

INGERSOLL - RAND COMPANY
11 Broadway, New York

Offices in Principal Cities the World Over. For Canada, refer Canadian Ingersoll-Rand Co., Limited, 260 St. James Street, Montreal, Quebec.

793-C

Ingersoll-Rand



Vertical Worm Gear Reducers

THE PLANETARY PRINCIPLE OF SPEED REDUCTION IS THE MOST EFFICIENT

On agitators, mixers, and other places where Vertical Drives are required, James Vertical Worm Gear Reducers "fill the bill." They are small and compact, noiseless and powerful. Their use permits having the motor set at a distance from the tank so that rising steam or vapors cannot injure the windings of the motor armature.

The application of James Speed Reducers is as wide as industry, and their reputation for dependable operation is upheld by instances of James Reducers in operation for more than fifteen years.

Write for Catalog

Manufacturers of

Spur and Worm Gear Speed Reducing Transmission, Spur, Bevel, Mitre, Worm, Internal, Helical and Tractor Gears. Rawhide and Bakelite Pinion—Racks.

The D. O. James Manufacturing Co.

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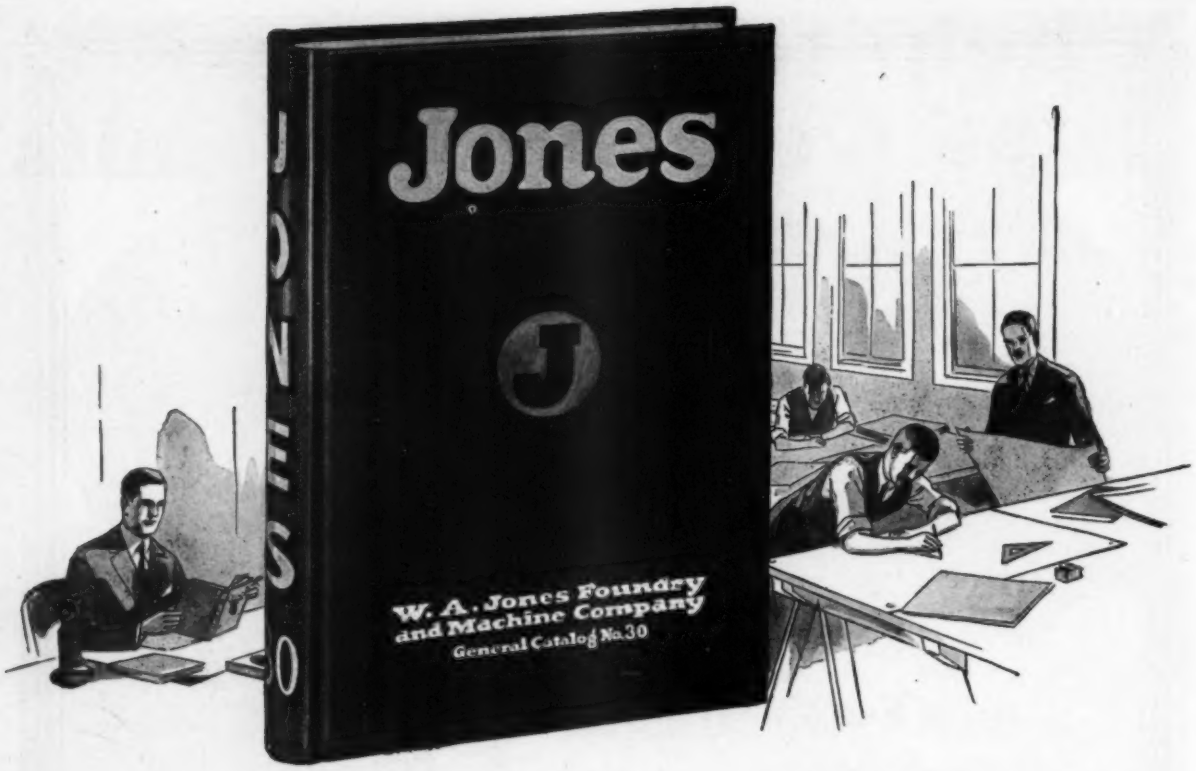

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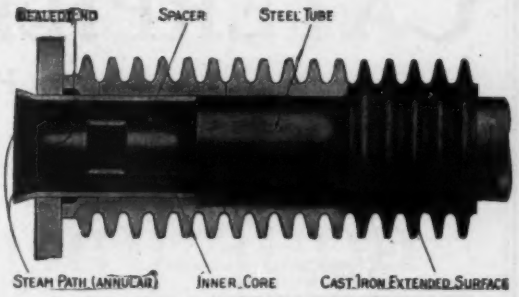

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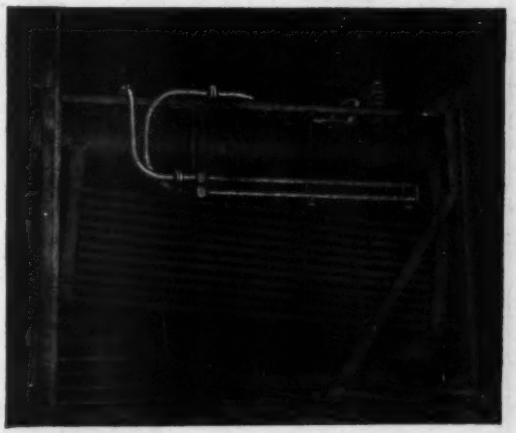

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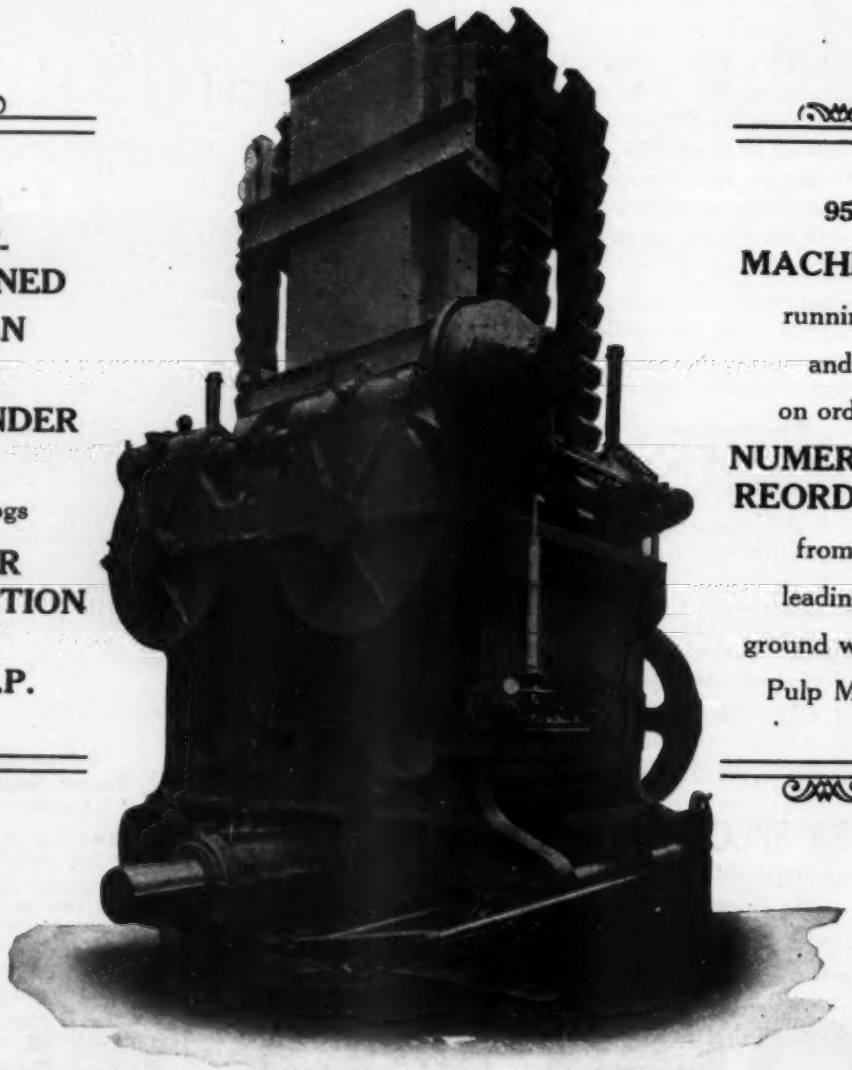

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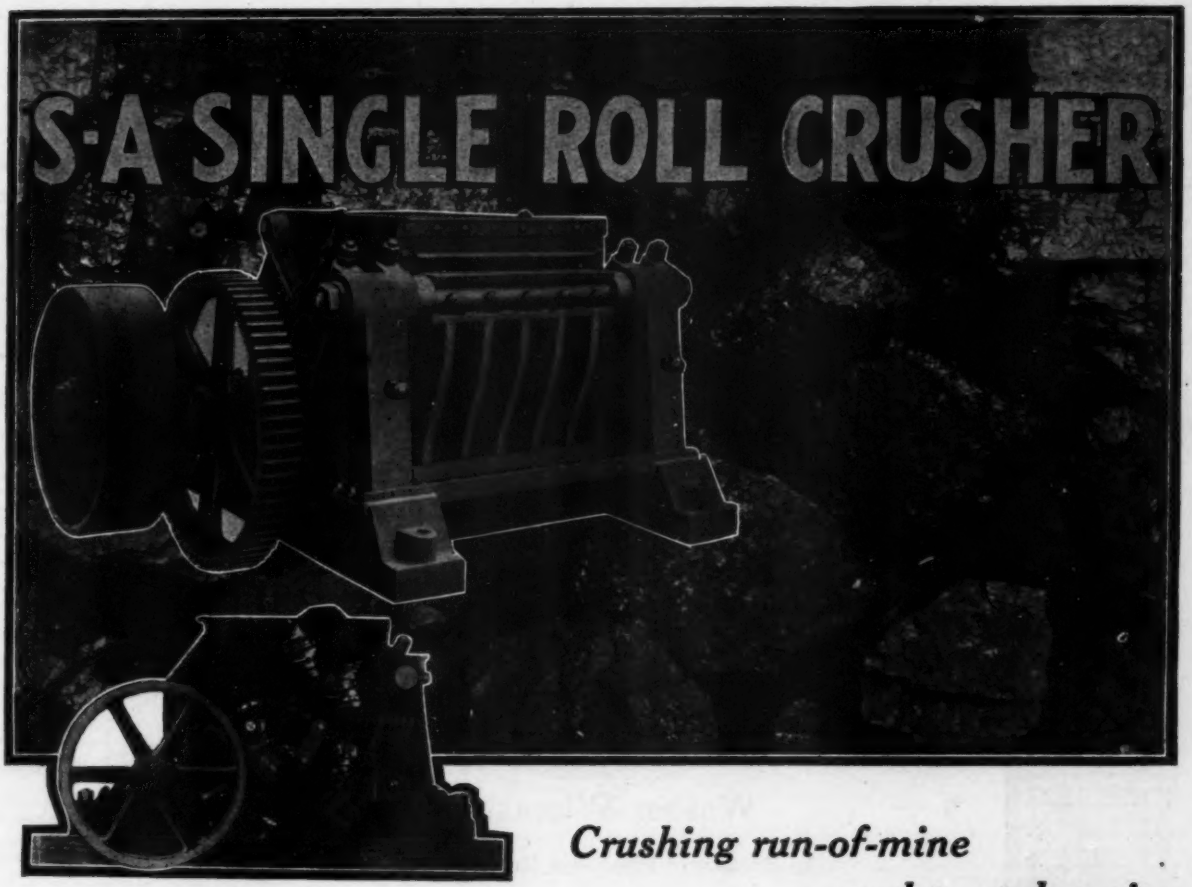

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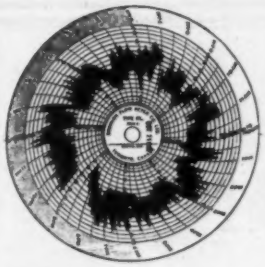

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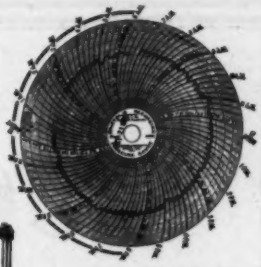

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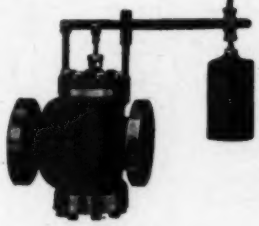

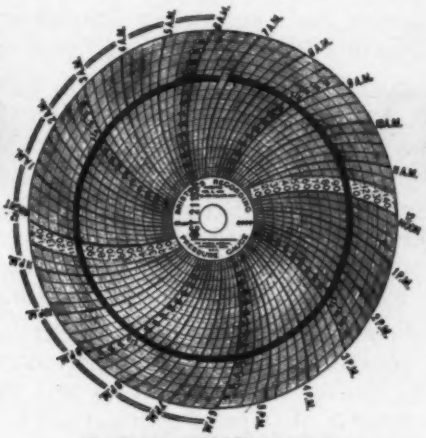

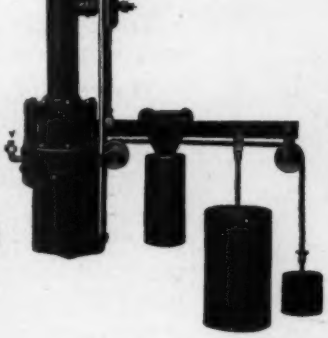

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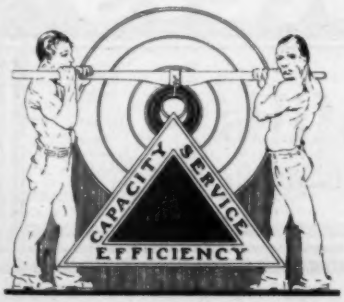

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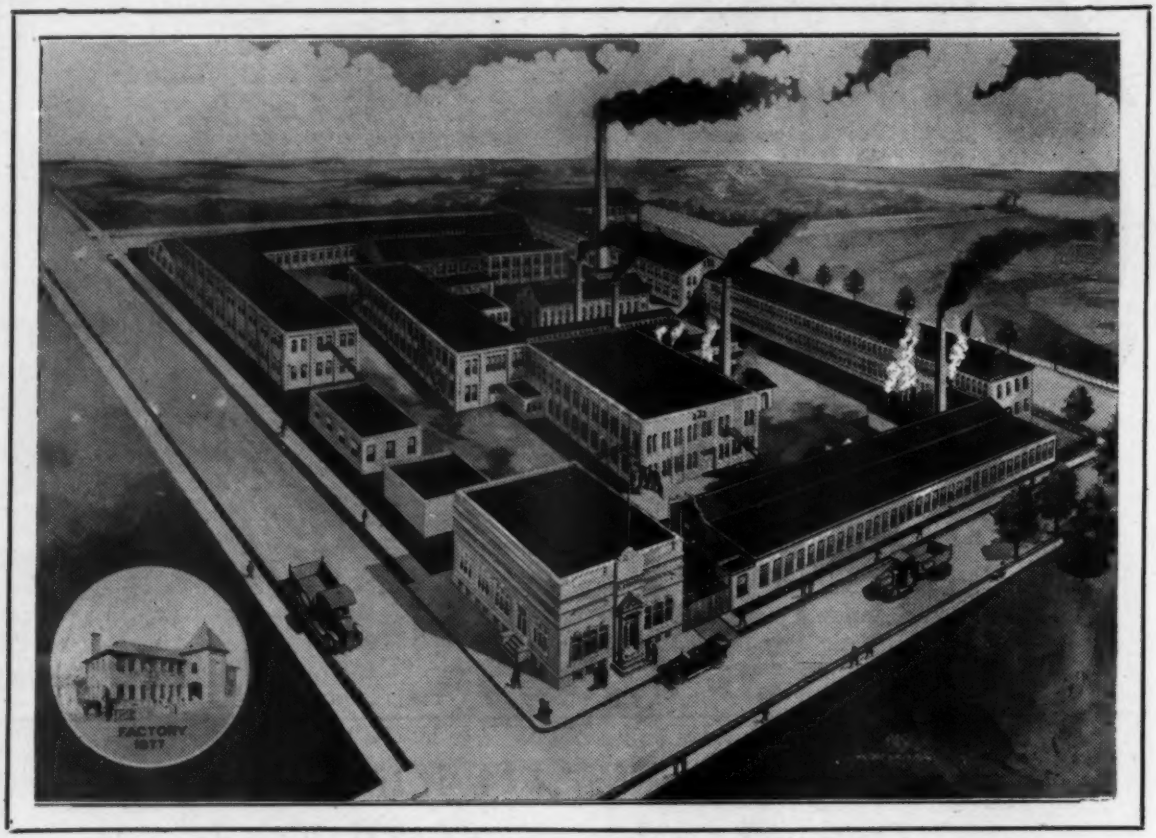

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THE PAPER INDUSTRY

REG. U. S. PAT. OFF.

Vol. 6 MARCH, 1925 No. 12

Application of the Ruths Accumulator in the Pulp and Paper Industry

By A. J. T. TAYLOR, A.S.M.E., A.I.E.E.
President, Vickers & Combustion Engineering Ltd., Toronto

THE PULP and paper industry belongs to that group of industrial enterprises in which fuel is an important item in the manufacturing cost. Valuable engineering work has been done to improve the steam generating plant. Not only has the efficiency of boilers and stokers been advanced to a high state of perfection, but problems concerning the efficient distribution of steam and the combination of process steam generating with power generation have been successfully attacked. However, difficulties still arise from the fact that a balance between consumption and production cannot be obtained. The consumption of the steam on one hand and the supply of heat on the other are by no means equivalent in qantity or coincident in time. The same difficulty occurs with back-pressure power plants where demand of process steam and of back pressure power are seldom in balance.

The Ruths steam accumulator system is an important invention in connection with variations in the demand of steam and power. It has been considered the most successful technical development of recent years as affecting improved conditions in steam and power consuming industries.

Ruths Steam Accumulator

The capacity of water to store large quantities of steam is made use of in the steam accumulator invented by Dr. Johannes Ruths of Sweden. By this accumulator fluctuation lasting up to one hour or more can be taken care of. In its principle it can be compared with a flywheel. A closer analogy, however, is the storage of water in high pressure accumulators in hydro-electric plants.

Ruths accumulators are built in the form of cylindrical steel tanks with hemispherical ends. They are filled with water up to 90-95 per cent of their capacity. Figure 1 shows such an accumulator in longitudinal section. (B) is the vessel constructed of riveted steel plates. (I) is a covering of non-conducting material usually consisting of a magnesia composition. (I-K) are insulation blocks covering the riveted seams of the shell. They are made removable, so as to enable the inspection of the seams to be readily carried out. The lagging is protected by a sheet iron cover (E).

The heat losses of the accumulators are considerably less than is generally imagined, and are so small that they are of no practical consequence. Results of insulation tests made on accumulators in practice show that with the thickness of insulation generally adopted, the heat losses correspond to from 0.1 to 0.5 per cent, only, of the coal consumption of the boilers, and are, therefore, of little importance. That being so, the accumulators are usually erected in the open air, and often at some distance from the boiler house, in factory yards, etc.

The accumulators are equipped with the fittings usual in boiler practice, and further with arrangements for the charging and discharging of the steam. The non-return valve (BV_1) admits charging steam to the internal steam distribution pipe (Z), and the charging nozzles (P), which are equipped with the circulation pipes (Q) to insure a uniform heating of the water. Through valve (BV_2) the discharge of steam takes place.

The expansion of the accumulator is provided for by erecting it on four lugs of cast steel which are riveted to the sides of the tank and distribute the bearing reaction over a large surface, at the same time serving to stiffen the plates. One support is fixed, whereas two rest on rollers, the one enabling longitudinal, the other lateral displacement. The fourth is a pendulum support allowing displacement in either

direction. Figures 2, 3, 4 show some typical installations of Ruths Accumulators.

Arrangement of the Accumulator

A general discussion of accumulator arrangement will be found below. Further on in this article, three typical arrangements of a Ruths Accumulator in pulp and paper mills will be described in detail.

As a rule, the accumulator is placed in the open air and connected between a high pressure and a low pressure steam line by means of regulating valves of special construction.

The operation of the accumulator installation is entirely automatic and the operation of the steam generating plant is simplified considerably. Since the boiler pressure is maintained constant by means of the regulating valves, this pressure is no longer used as a guide in firing the boilers. This has now to be done in accordance with the accumulator pressure which is indicated in the boiler house by master gauge. The boilers are normally operated at a constant rating corresponding to the average consumption of steam. Only in case the accumulator pressure tends to reach its highest or lower level does the load in the boilers have to be decreased or increased slightly.

The regulating valves are oil pressure operated, and are very sensitive and reliable. They form the "steam switchboard" of the plant, securing constant steam pressures in all steam mains, and making possible a reliable and simple centralized steam control. The

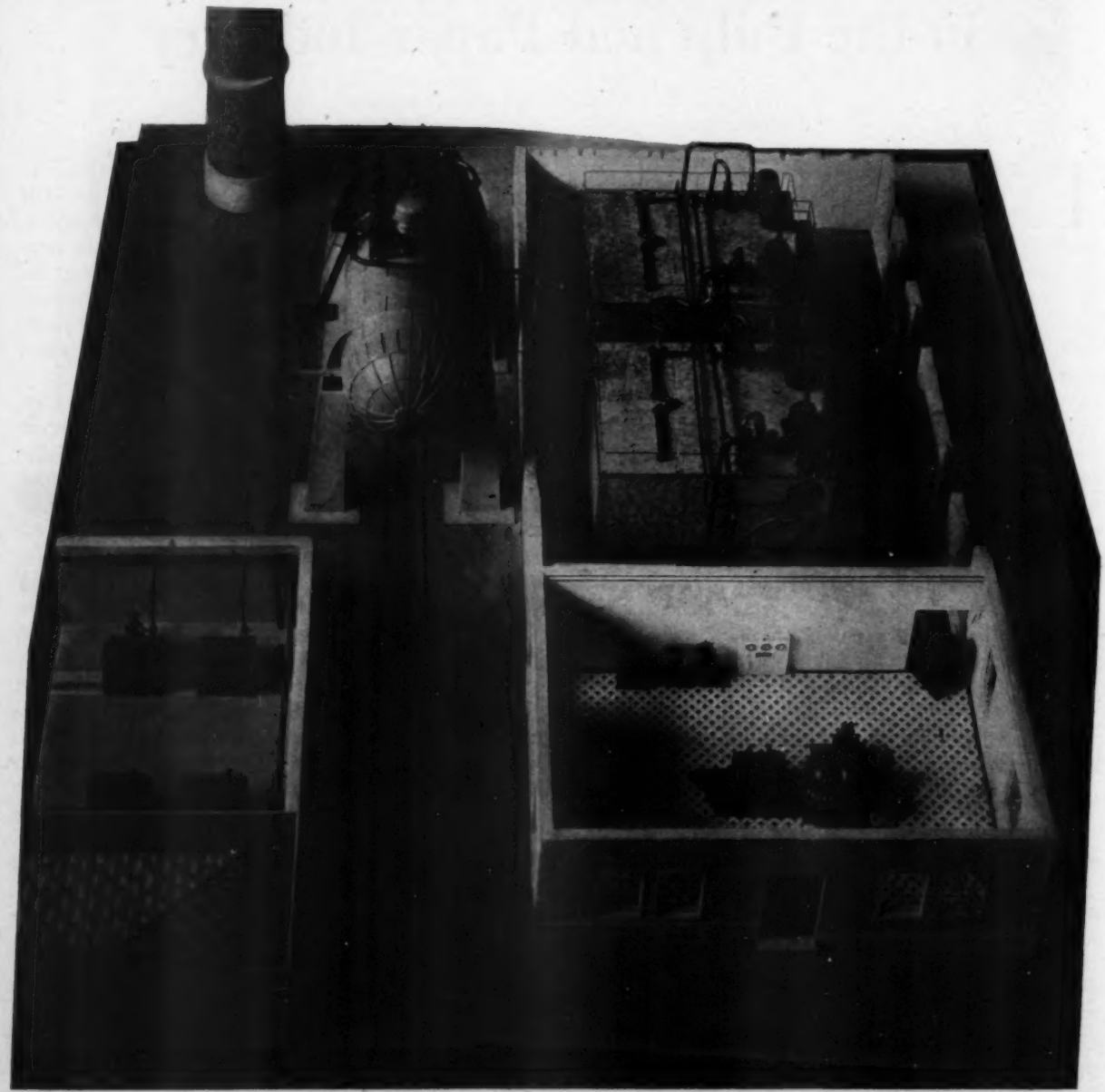


Fig. 2—Model of Ruths accumulator installation exhibited at Wembley

valves are automatically controlled by the different steam pressures, as indicated on the piping diagrams by dotted lines. A relay is mounted on each valve in which a small variation in the steam pressure of fractions of a pound causes a considerable change in the oil pressure by means of which the valve is operated.

The most remarkable features of this pressure regulator, which have never before been combined, are: it is sensitive in operation; a single valve can be controlled from two and more different pressures; all parts work in oil and, therefore, are subject to practically no wear, with consequent reliability; it can be shut in a moment by means of an emergency trip handle and it can be operated if necessary by means of a hand wheel. Figures 5 and 6 are photographs of typical steam switch boards.

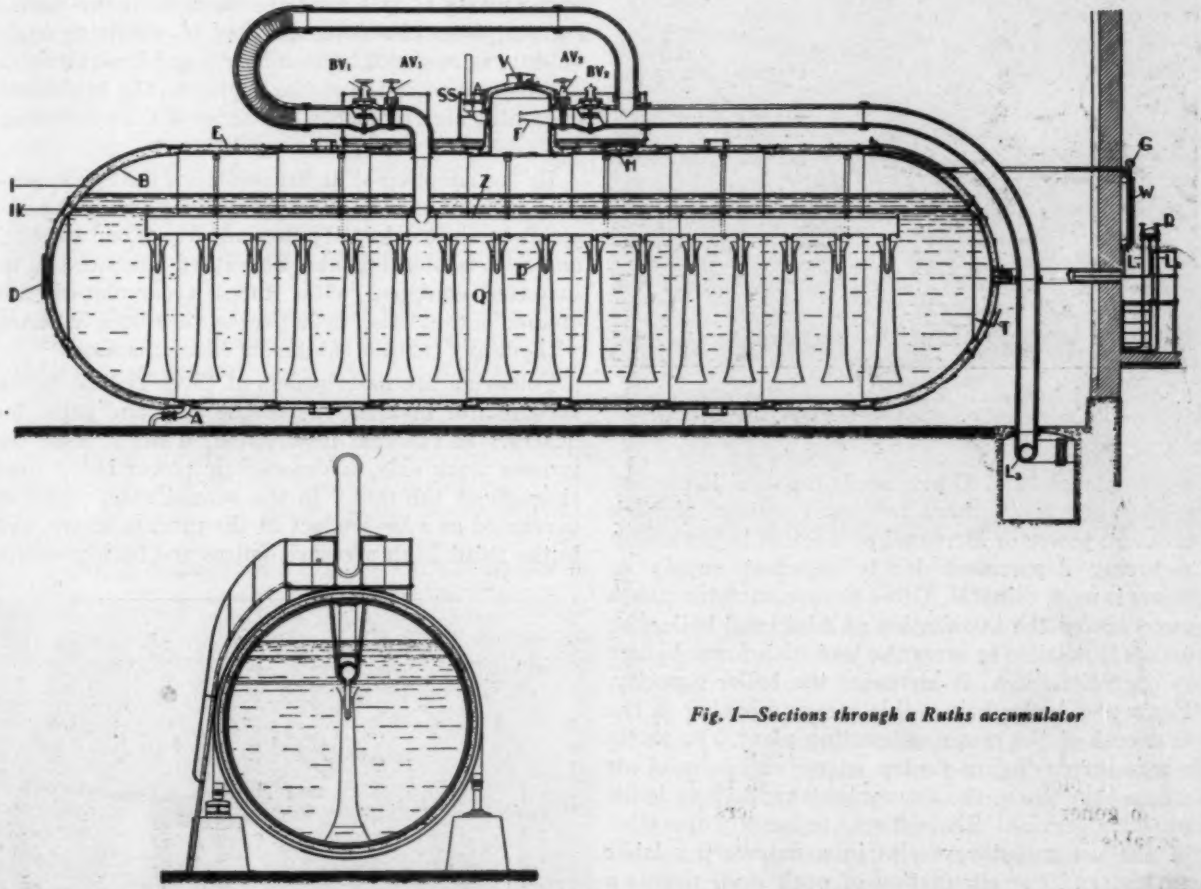


Fig. 1—Sections through a Ruths accumulator

Size of the Accumulator

The capacity of an accumulator for a given plant is determined by the magnitude of the fluctuations of the steam consumption only and not by the capacity of the boiler plant. Thus a steam flow chart showing the total steam consumption of the plant, or, if the steam consumption is fluctuating in one department, a chart from this department will be sufficient for calculating the capacity of the accumulator. The storage capacity must be equal to the largest surface area above or below the line of the average steam demand.

The volume of the accumulator is a function of the required accumulating capacity and the permissible pressure drop. Fig. 7 shows the relationship between maximum pressure, minimum pressure and storage capacity of 1 cu. ft. of water at different drops in pressure. By using this diagram the volume of the accumulator can be easily calculated. Suppose the accumulator is connected between two pipe lines carrying a pressure of 100 lbs. per sq. in. and 20 lbs. per sq. in., according to the diagram, 1 cu. ft. of water then can store 4.8 lbs. of steam. If a storage capacity of 25,000 lbs. of steam is desired and the accumulator is filled to 90 per cent with water, the volume of the accumulator will be

$$\frac{25{,}000}{4.8 \times 0.9} = 5{,}800 \text{ cu. ft.}$$

Steam accumulators have been built in sizes of from 200 cu. ft. volume to 12,000 cu. ft., and in one mill an accumulator installation of a total volume of 37,000 cu. ft. with a capacity of 150,000 lbs. of steam

has been erected. However, it was subdivided into three separate compartments.

General Benefits

The benefits of the Ruths steam accumulator system are dependent upon the conditions in the individual steam plant. In some plants, the fuel saving

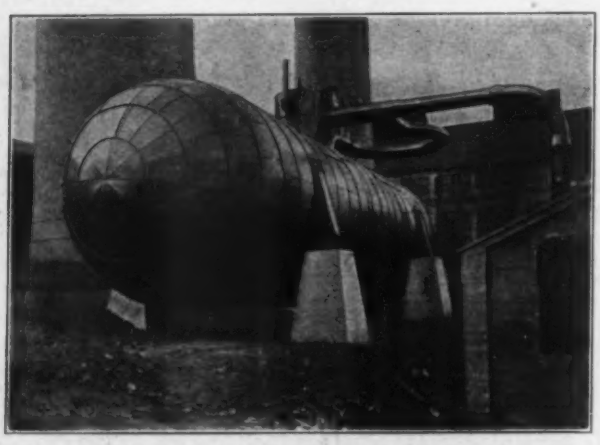


Fig. 3—Ruths accumulator in the Kvarnsveden Paper Mills of the Stora Kopparbergslags A.B., at Kvarnsveden, near Borlange, Sweden. Capacity 6350 feet

ranging from 10 to 30 per cent is the most important advantage; in another, increased output of back pressure power or increased production in the manufacturing department due to sufficient supply of steam is most valuable. Often the accumulator makes unnecessary the installation of additional boilers or makes it possible to carry the load with fewer boilers in operation; i. e., it increases the boiler capacity. For a new boiler house, this means a saving in the first cost of the steam generating plant. In plants where surplus hydro-electric energy can be used for steam generation, the accumulator renders an indispensable service. The entirely automatic operation of the accumulator results in a noteworthy labor saving, and the elimination of peak loads means a reduction in the strains placed on the boiler brickwork which accompany a fluctuating load, and further, the stokers never need be forced. This will reduce the upkeep costs for boilers and stokers to a minimum.

The economy in fuel consumption is readily understood, but the increased output from the factory seems to be a more important matter and needs some explanation.

Lack of steam often occurs in factories just when an increased supply of steam is badly needed for carrying on a manufacturing process. The process is then delayed or the quality of the product lowered. Through eliminating the loss of time due to the sluggishness of the boilers in face of a sudden demand for extra steam, the Ruths accumulator makes possible an increased production. For example, a heating process normally consuming steam at the rate shown by Curve 1 in Fig. 8 (which rate is dependent on the steam supply from the boilers), can be intensified by accumulated steam to the high rate shown by Curve 2, whereby the time (T-t) is saved.

Further, it must be borne in mind that, as a rule, of two operations proceeding simultaneously, the cruder process, such as "heating up," etc., will generally use steam to the detriment of the more refined operations like drying or chemical processes. By impediments of this kind the conduct of the manufacture, from the point of view of obtaining high quality, is rendered more difficult, and irregularities of this nature in the steam supply to the individual apparatus are frequently the cause of the production of so-called "second grade" qualities.

By the adoption of an accumulator, the steam generating plant and the different manufacturing departments can be conducted independently of one another, and with something like laboratory exactitude. In factories equipped with Ruths accumulators, increased output of up to 25 per cent has been obtained without any further equipment being installed.

Following are descriptions of three typical Ruths accumulator installations in the pulp and paper industry. In the first installation, steam is used for process work only, hydro-electric power being used throughout the mill. In the second case, power is generated as a by-product of the process steam, and in the third, high pressure boilers and back pressure

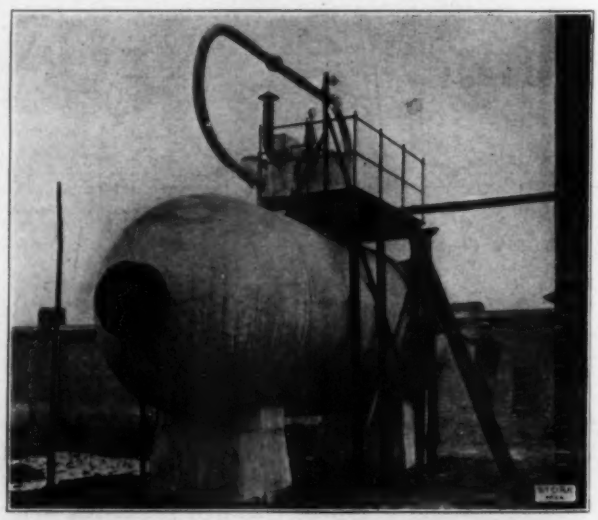


Fig. 4—Ruths accumulator in a linoleum factory

turbines are installed. The benefits of the accumulator in each case will be analyzed.

Case I

Steam is required at 120 lbs. pressure by sulphite digesters and at 25 lbs. pressure by paper machines. No power is generated by steam, hydro-electric power being applied throughout the mill. The present steam consumption is shown in diagram Fig. 9. As is to be

seen from this diagram, the boilers have to take care of variations in the steam demand of from 85,000 to 185,000 lbs. per hour of steam. Due to this fluctuating load the boiler pressure cannot be kept constant but swings up and down between 90 and 120 lbs. per sq. in. In a plant like this the installation of an accumulator of sufficient capacity will result in a boiler load and a boiler pressure as shown by the straight lines in Diagram 9. The arrangement of the steam plant according to the Ruths steam accumulator system is shown in Fig. 10. The accumulator is connected to the existing piping system of the mill by means of the two regulating valves (V-1) and (V-2). Regulating valve (V-1) is an overflow valve which maintains automatically a constant pressure of 120 lbs. in the boiler house main. Regulating valve (V-2) is a reducing valve maintaining the pressure in the mains to the paper machines at constantly 25 lbs. The digesters are connected directly to the 120 lbs. line.

Operation.—After the installation of the Ruths steam accumulator, the boilers may be fired at a constant rating, generating an amount of steam corresponding to the average steam consumption of the mill. If steam production and steam consumption are in balance, all 25 lb. steam will be delivered directly from the boilers through regulating valves (V-1) and (V-2), no steam passing to or from the accumulator.

If a peak occurs in the steam consumption, for instance in the digester house due to the starting of

Fig. 5—Steam switchboard in the Slottsbrons sulphite mill

a cook, the 120 lb. pressure would tend to drop. However, a very slight decrease in this pressure will cause regulating valve (V-1) to throttle the steam flow through this valve so that the 120 lb. pressure is maintained practically constant. Less steam will consequently be delivered through valve (V-1) to the accumulator line. Pressure in this line will, therefore, start to drop, the check valve in the discharge pipe at the dome of the accumulator will open, steam will be evaporated in the accumulator and delivered through reducing valve (V-2) to the paper machines. Thus, the accumulator system has taken care of a peak load in the digester house by keeping sufficient high pressure steam back in the 120 lb. main and supplying the low pressure consumers during this period with steam from the accumulator.

If now a digester is blown down and the consump-

Fig. 6—Steam switchboard at Svenska Sockerfabriks A.B., Arlof, Sweden

tion of high pressure steam decreases, the excess steam in the 120 lb. main is automatically passed through valve (V-1) to the accumulator line. If, then, more steam is supplied to this line through valve (V-1) than is taken by the paper machines through valve (V-2), pressure in the accumulator line will increase, the check valve in the charging line will open and admit the surplus steam to the water space of the accumulator where it is stored until the consumption of steam again surpasses the supply from the boiler house.

It is evident that increased demand for 25 lb. steam will be taken care of directly by steam being discharged from the accumulator through reducing valve (V-2). Or if, for instance, a paper machine is shut down, reducing valve (V-2) will close accordingly, and an amount of steam corresponding to that previously used by the said paper machine will be passed to and stored in the accumulator.

Size of Accumulator.—Basing upon the steam flow curve in Fig. 9, the installation of an accumulator with a capacity of 40,000 lbs. of steam with each discharge from 120 lbs. to 25 lbs. pressure is proposed. The dimensions of this accumulator are 14 ft. diameter by 61 ft. total length, corresponding to a total volume of 8,500 cu. ft.

Case II

The steam plant is built to stand 250 lbs. pressure,

but is at present operated at about 150 lbs. However, the supply of hydro-electric power is insufficient, so that make-up power has to be generated by steam. So as to reduce the cost for this make-up power, a double bleeder turbine in connection with a Ruths accumulator is to be installed.

The arrangement is shown diagrammatically in

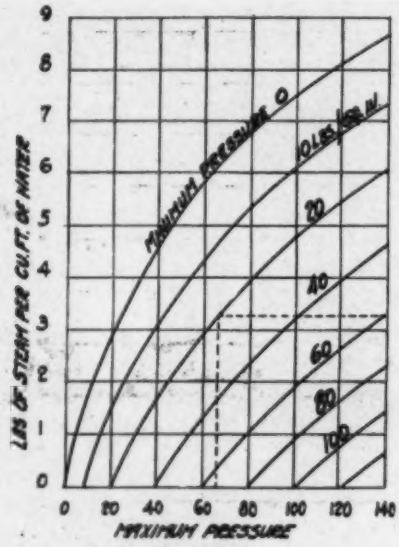


Figure 7

Fig II. All process steam in the plant is utilized for generation of back pressure power by a double bleeder turbine. Live steam is supplied to the turbine at 250 lbs. pressure and steam is bled at 90 lbs. for digesters and 20 lbs. for paper machines. Five regulating valves (V-1) to (V-5) forming the steam switchboard provide for constant pressures in all steam mains. Valves (V-1) and (V-2) have the same function as in Case I. The pressure regulation of the double-bleeder turbine is done by valves (V-3) and (V-4), the steam flow being also regulated by a governor. If the power demand is small surplus steam is passed through valve (V-5).

Operation.—When a digester is shut down the the steam consumption in the digester line drops. This will result in a slight increase of the steam pressure in the digester line, which will tend to open valve (V-4). However, this valve is also controlled by the 20 lbs. pressure, so that it does not admit more steam than is necessary to maintain 20 lbs. pressure in the paper machine line. The surplus of steam in the 90 lbs. line will, therefore, be passed through valve (V-1) and stored in the accumulator.

When a digester is started, causing a high peak in the consumption of 90 lbs. steam, this pressure will tend to drop, which closes first valve (V-1) and then

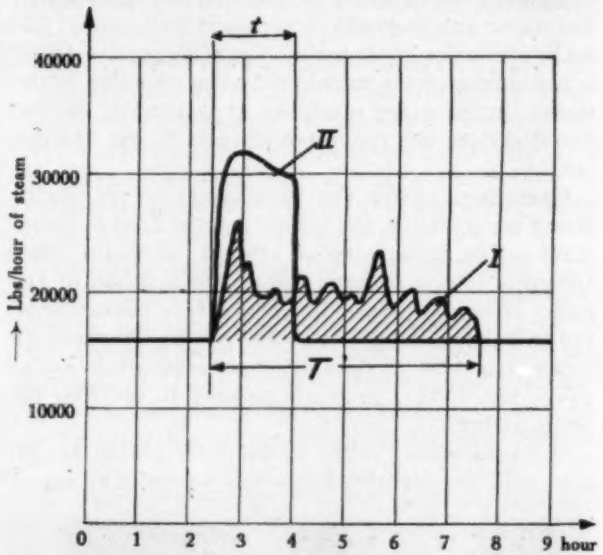


Fig. 8—Reduction in time required to get up steam in factory after installation of Ruths accumulator

continues to close valve (V-4) until the pressure remains constant. As a result of this, less steam is coming down to the 20 lbs. line, the reducing valve (V-2) will open and the accumulator will deliver the same amount of steam to the paper machines as the digesters are taking above normal.

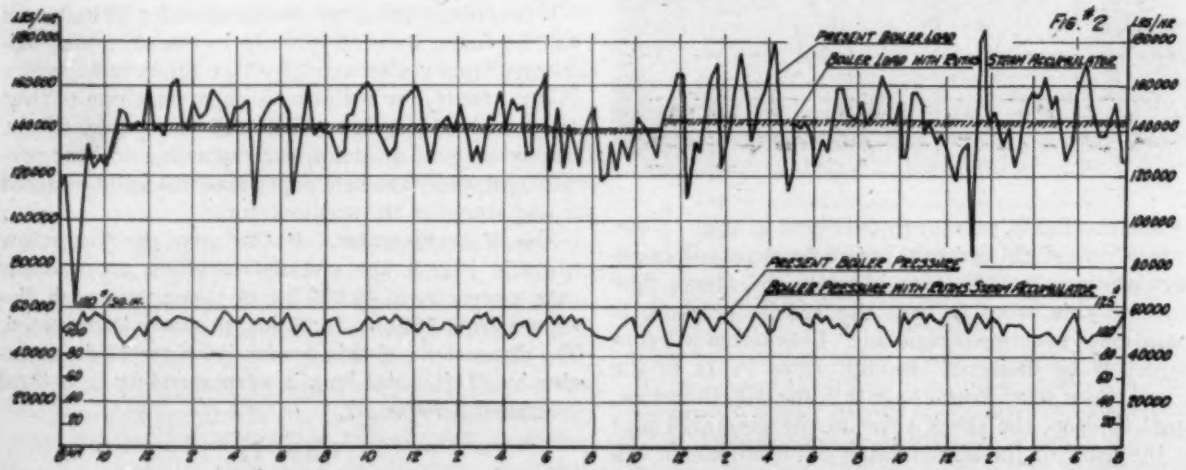


Fig. #2
PRESENT BOILER LOAD
BOILER LOAD WITH RUTHS STEAM ACCUMULATOR
PRESENT BOILER PRESSURE
BOILER PRESSURE WITH RUTHS STEAM ACCUMULATOR

Figure 9

By this arrangement any variation in the steam consumption wherever it occurs in the mill will be taken care of by the accumulator as long as the pressure in the same is within its limits of 90 and 20 lbs. per sq. in.

Case III

At present, steam for the mill is generated in an old boiler house at 140 lbs. pressure for condensing

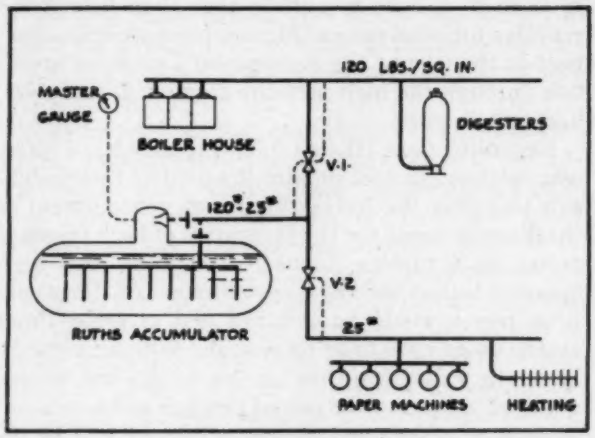


Figure 10

turbines, and soda and sulphite digesters, and at 110 lbs. for paper machines, evaporators and other consumers. The mill owns a hydro-electric power station, however, the power obtained is insufficient so that part of the power required in the mill has to be generated in the condensing turbines. It is proposed to install high pressure boilers and non-condensing turbines in order to replace as far as possible the expensive power from the condensing turbines.

The arrangement of the steam and power plant, according to the Ruths steam accumulator system, is shown in Fig. 12.

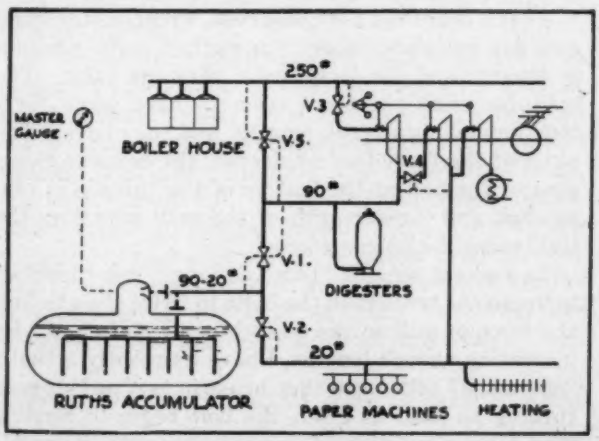


Figure 11

Hereby it is assumed that new boilers, delivering steam at, for instance, 400 lbs. pressure and 150° F. superheat be installed. Further, one or more non-condensing turbines would be installed capable of expanding all of the steam generated in these boilers from 400 lbs. to 140 lbs. pressure. Steam also may be by-passed to these turbines through regulating valve (V-1).

From the 140 lb. main, steam will be supplied to the soda and sulphite digesters, to the existing straight condensing turbines and to the steam engines for the paper machine drives. Further, an additional non-condensing turbine may be installed between the 140 lbs. and 15 lbs. so as to be able to generate power from the "make-up" steam required in the 15 lb. main in addition to the steam supplied from the steam engine.

The accumulator, working in the pressure range of from 140 lbs. to 40 lbs. is connected to the mill piping by means of the regulating valves (V-2) and (V-3), which have the same function as valves (V-1) and (V-2) in Case I.

The non-condensing turbines are to be equipped with a combined pressure and speed control. The speed governor would only regulate the steam flow to these turbines during such periods when the de-

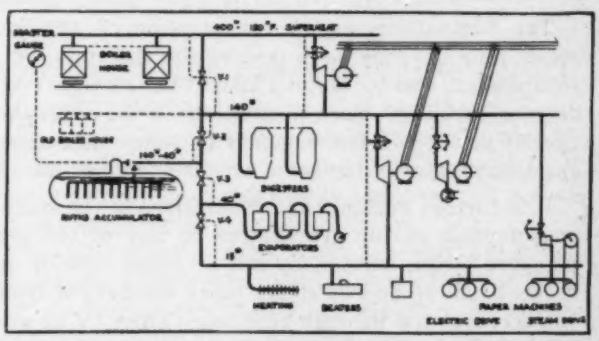


Figure 12

mand for power is smaller than the amount of non-condensing power obtainable from the process steam. Normally, however, it is desired to pass all the process steam through these turbines. This is obtained by controlling these turbines by pressure regulators which have to co-operate in a definite way with the pressure governors (V-1), (V-2), (V-3) and (V-4).

Operation.—A constant amount of steam, corresponding to the average steam consumption of the mill, is generated in the boiler house. The pressure regulation of the non-condensing turbines is working similar to a relief or excess pressure valve for the boiler house main and the total steam flow from the boilers will, therefore, automatically be passed through these turbines. In case the speed governors should cut off part of this steam flow through the turbines, such steam would automatically be by-passed through excess pressure valve (V-1), which is adjusted for a slightly higher pressure than the pressure controls of the turbines. Thus, the boiler pressure and, due to the constant rating, also the superheat will continuously be maintained at their

highest level and popping of the safety valves is prevented.

A constant amount of steam will thus be supplied to the 140 lbs. line. The fluctuations in the amount of steam drawn from the 140 lb. steam line are now taken care of by the accumulator as follows:

If a peak occurs in the consumption of 140 lb. steam, regulating valve (V-2), which is working as an overflow valve for the 140 lb. line, will shut off part of the steam flow to the evaporators, and the accumulator will start to discharge and supply an amount of steam to the evaporators corresponding to the amount of steam shut off by valve (V-2). With an exceptional high peak, valve (V-2) may close completely so that the entire boiler load will be at disposition in the 140 lb. steam line and all steam for the evaporators will be delivered from the accumulator through reducing valve (V-3). On the other hand, if the consumption at the 140 lb. steam line goes down so that more steam is passed through valve (V-2) than is required by the evaporators, such excess will be passed on to the accumulator, where it will be stored until the next peak load occurs.

The fluctuations in the consumption of 140 lbs. steam may not only be caused by the digesters, but, for instance, also by varying load at the straight condensing turbines. Such fluctuations in the consumption of power will consequently be taken care of by the accumulator in the same way as explained above.

It is further evident that fluctuations in the steam consumption of the evaporators or any of the low pressure steam consumers will be taken care of directly by more or less steam being discharged from the accumulator through reducing valves (V-3) and (V-4).

The non-condensing turbine arranged between the 140 lb. and 15 lb. pressure lines is controlled in such a way by both of these two pressures that an amount of steam is passed through the same, which will not exceed the available amount of steam in the 140 lb. line and also will not exceed the amount of "make-up" steam required in the 14 lb. line.

Valves (V-1 and V-2) and the pressure controlled valves of the non-condensing turbines have still another function. In case the accumulator should happen to become completely discharged, these governors work as reducing governors, so that always sufficient steam will be supplied to the various steam consumers. In such an exceptional case, the boiler pressure will start to drop and the firemen will have to increase their fires. On the other hand, if the accumulator should happen to become completely charged, the above mentioned regulating valves will work as limit pressure valves, protecting the different steam mines and the accumulator against excessive pressure. In such a case the safety valves at the boilers will start to blow until again the condition has been met by the firemen.

Summary of Advantages

The general advantages of the Ruths steam accumulator system have been described on the preceding pages. As to Case I, not much has to be added. It may, however, be pointed out that every 1 per cent increase in boiler house efficiency in this case means an annual saving of $4,000, and that an accumulator installation of this size would cost about $40,000. In Case II, it is to be noticed that the accumulator provides for constant and highest pressure and superheat at the inlet of the turbine and a constant steam flow through the high pressure stage and, therefore, highest efficiency.

Regarding Case III, the following may be of interest: without an accumulator it would be rather difficult to utilize the fluctuating steam consumption of the digester house for the generation of back pressure power in a turbine connected between the high pressure boilers and the digester main. At times only little power would be obtained and at other times steam would have to be by-passed. With an accumulator, the steam flow through the turbine will be constant, all steam may be passed through and a constant amount of power and highest efficiency will be obtained. Of special interest is the fact that high pressure boilers may be installed and by using a non-condensing turbine for reducing the steam pressure to the pressure in the present mill system no changes have to be made in the existing steam distribution system.

Don't Lengthen Your Wrenches

I have several times seen the "kink" in print which shows how to make a wrench longer by "slipping a gas pipe over." It is a very simple procedure, and it may look good to some, but I can't believe in making a wrench longer in order to put nuts on tighter.

As you doubtless have observed, wrenches for small nuts are invariably short; for medium nuts, medium in length; and for large nuts, they are long. The manufacturers therefore seem to have some "system" in making wrench lengths, and they have. The pitch of the thread as considered, the cross-sectional area of the bolt at the bottom of the threads is considered, and the strength of the man who does the tightening is also considered.

To make a wrench "twice as long," you therefore increase the tension on the bolts to twice the amount, the force of pull on the wrench being the same. By increasing wrench lengths, I have frequently actually "stretched" bolts until they broke in two, or I stopped turning as soon as I felt the bolt begin to stretch. This is poor practice. I do not increase the wrench's length any more, because I realize that the elastic limit of a bolt should never be reached.

If you feel like making a wrench longer for "unscrewing" a nut—all right. But don't make it longer for tightening.—Schaphorst.

Pointers for the Engineer

By W. F. SCHAPHORST, M. E.

Steam Pipes Are Often Too Small

AS FUEL is continuing to increase in cost, it is urgent that we pay more attention to the size of our pipe lines, particularly steam pipe lines. If there is anything that is liable to cause a tremendous waste of heat, it is a steam pipe or heating coil that is too small.

Take for example the possibilities of use of exhaust steam. Exhaust steam has a temperature of at least 212 degrees Fahr. when released to the atmosphere. It is therefore capable of heating liquids and gases to a temperature of nearly 212 degrees Fahr. However, very seldom do we find instances where waste is made to heat to a temperature of 212 degrees. The method that is easiest and that costs least at first is to use small pipes and high pressure steam is employed to do the heating. The pipes are usually so small that sufficient exhaust steam cannot get in, consequently higher pressure steam is needed. The exhaust steam that should be used instead is wasted because it cannot be gotten into the small pipeline in sufficient quantity. This, therefore, may double the amount of waste steam at atmospheric pressure.

Sometimes where exhaust steam from steam engines is used, the back pressure is allowed to build up to such a great extent (because of the small pipes that are provided for utilizing exhaust steam) that the engine capacity is greatly reduced requiring the installation of an additional engine. Larger pipes for handling exhaust steam would solve these problems in many cases, yet this is a point that is seldom thought of because engineering practice has apparently standardized on comparatively small sizes of exhaust piping.

Before buying equipment that must be heated with steam, it often pays to look into the possibility of using exhaust steam. It is well to make a study of the relation between the temperature, pressure and volume of steam. Knowing the exhaust pressure, the temperature can be found from steam tables. The volume can also be found. Then, knowing the volume, it is an easy matter to compute the sizes of pipe or coil needed and it is also possible to determine to a surprising degree of accuracy just what the proper and most economical steps would be.

How Wide Should the Pulley Be?

SOME users of pulleys make the mistake when purchasing pulleys to buy them of exactly the same width as the belts that are to be used on them.

It would be all right to use a pulley of the same width as the belt if the pulley and belt were perfectly aligned and ran so perfectly that there would be no over-hang at any time. As one manufacturer has recently pointed out "A belt half off the pulley is only half a belt." Thus, if the pulley purchased is of the same width as the belt and if there is any swaying from side to side the capacity of the belt will naturally be reduced.

A very good rule to use for determining the proper width of pulley is this: Multiply the width of the belt by 1.15 and add 0.3 inch.

For example, if the belt is 10 inches wide: — 10 x 1.15 — 11.5. Adding 0.3 inch we get 11.8 inches.

However, since standard pulleys are not made exactly 11.8 in. wide, that is an odd size, and we must naturally select a pulley 12 inches wide, which is a standard size.

It is always better to be safe and use a pulley that is too wide rather than one that is too narrow in the same way that it is always better to be safe and use a belt that is too wide rather than a belt that is too narrow.

Make Steam Pipes a Trifle Short

A METHOD for dimensioning lengths of steam pipes so they may be removed easily in case repairs are needed is now being used by an eastern designer holding a responsible position with a well-known engineering company.

Usually, where a straight steam pipe line is laid in an average boiler room, little if any allowance is made for pipe expansion when under steam. The expansion is permitted to take care of itself, which often is the cause of creating dangerous stresses in the pipes and auxiliary connections.

To overcome these stresses in places where bends are to be avoided as much as possible, this designer makes the pipe initially too short—about 1/10 inch for every ten feet, or one inch per hundred feet. The longitudinal stresses are therefore in the pipe when cold—in tension. And should it be desired to take a length out, a bolted flange-pipe may be dropped out easily.

When under steam, the shortage is taken up by expansion and it is computed that there are no longitudinal stresses in the pipe whatever. This is as it should be for the insurance of safety.

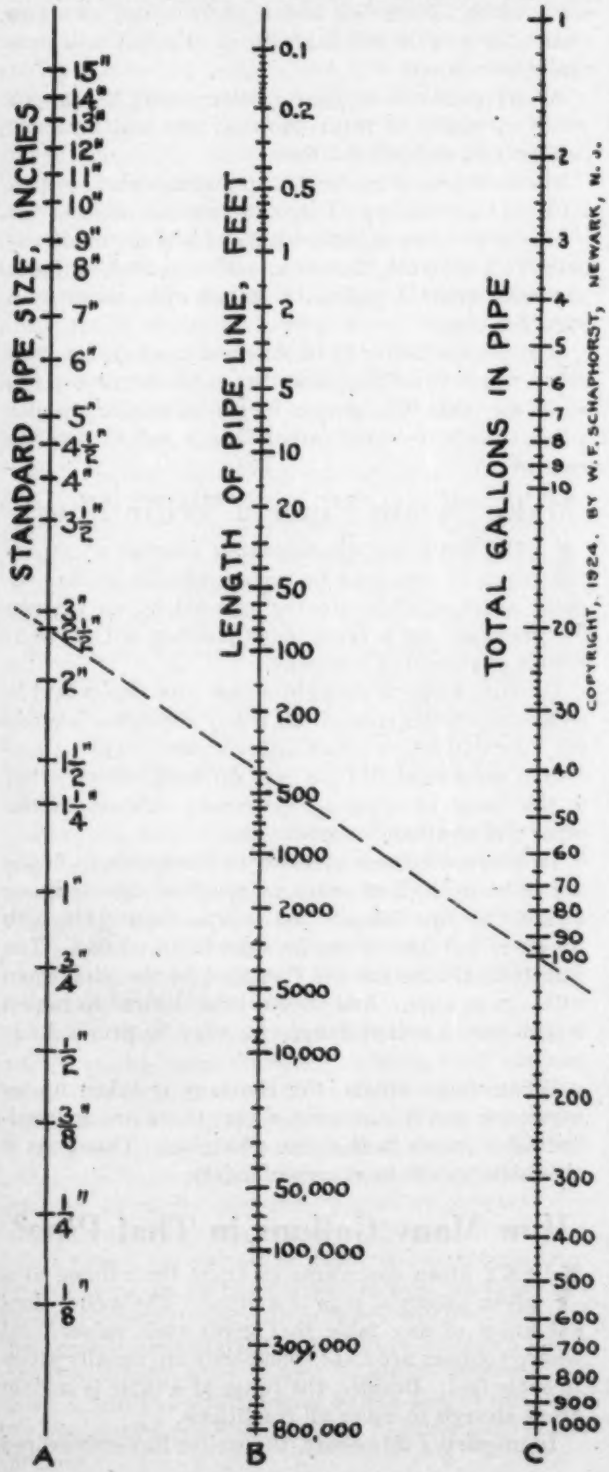
How Many Gallons in That Pipe?

VERY often one wants to know the volume of a given length of pipe in gallons. The writer does not know of any table that gives such values, and where volumes are to be found they are usually given in cubic feet. Besides, the range of a table is seldom great enough to cover all conditions.

In preparing this chart, the writer has endeavored

to include more than average conditions. It takes care of all of the standard pipe sizes from ⅛ inch to 15 inches in Column A, and any length of pipe from 0.1 foot to 800,000 feet in Column B. Column C shows volumes from 1 to 1,000 gallons. Surely, this is great enough to take care of nearly any condition.

To use the chart, simply run a straight line through the pipe size (Column A) and the length of pipe line in Column B, and the intersection in Column C immediately gives the total number of gallons in the pipe.



For example, the dotted line drawn across this chart shows that if the pipe size is 2½ inches (Column A) and the length of pipe is 400 feet (Column B), the 100 gallons in Column C is the volume of the pipe.

Inversely, if it is desired to know the length of pipe line required to hold a given number of gallons, or the size of the pipe necessary to hold a given number of gallons within certain limitations of length, the chart may be conveniently applied; or, knowing two factors in any two of the three columns, the unknown in the third column is quickly found.

Saves Oil

ONE engineer saves all oil drips by allowing them to be absorbed in old felt pads and blankets. He then saves these blankets and pads. He also saves all oily waste, etc. Then, every once in a while he runs the blankets through an ordinary wringer. The oil is thus squeezed out and afterwards reclaimed by passing it through a filter. It is then clean and ready for re-use. Good oil is worth reclaiming and using repeatedly.

Anthracite Coal Sizes

ACCORDING to Mr. C. F. Hirshfeld, of the Detroit Edison Company, the various sizes of anthracite coal can be determined as follows: No. 4 buckwheat will pass through a screen having a 1/16 in. square hole. No. 3 buckwheat will pass through a ⅛ in. hole and will be retained on a 1/16 in. hole. No. 2 buckwheat will pass through a screen having a 1/16 in. square hole. No. 1 buckwheat passes through a ½ in. hole and remains on a ¼ in. hole. Pea coal passes through a ¾ in. hole and remains on a ½ in. hole. The size that is most commonly used in power plants is No. 3 buckwheat.

CO_2 Insurance

I HAVE before me a testimonial letter in which the superintendent of power says:

"A drop of 4 per cent in the CO_2 content would increase our fuel consumption about 6 per cent, which would mean a loss of about $28,000 a year. It is well worth the small operating cost of the recorder to be insured against such losses."

It is an excellent idea to look upon CO_2 recorders in this fashion—as an insurance against low CO_2. By installing a CO_2 recorder, it becomes a fairly easy matter to keep the CO_2 contents in the flue gases where they belong. Even though one's savings may not be as great as $28,000 a year, the invariable rule is that a good modern recorder quickly pays for itself. One well known superintendent states that his recorder pays at a rate of 500 per cent a year, which surely is not bad.

Foreman Training in the Paper Industry

Part II—How to Plan and Lead Foreman Training

By J. K. NOVINS

Author of "A Training Program for the Factory Foreman," "Foreman Training in Practice." "Manual of Practical Training for the Railroad Foreman," etc.

Leading the Foremen's Conference

IN THE preceding article the writer described a typical foremen's conference as developed in several typical paper plants. Let us now go below to watch the engineer work—to see how he oils the machinery and sets it in motion. The successful leader of the foremen's conference is successful only in proportion to the amount of latent power displayed and brought to the surface by the foremen. The leader oils the machinery; he marks the charts; he sets the clock, and under his skillful hand it runs smoothly and happily. First, the leader must secure proper background for the conference; second, he must plan properly, and third, not once must he forget that his position is that of a group leader, and not merely as a teacher or authoritative executive of the plant.

In order to properly convey the principles of effective group leadership, the writer, most appropriately, has drawn from the cumulative experiences of successful group leaders in the paper and other industries. In addition to interviewing successful foremen conference leaders, the writer has sought every opportunity to watch such conferences in actual operation, and in a measure to even participate in the foremen's discussions. Fortunately, however, the important phases of good leadership have been brought up again and again at state conferences held in Minneapolis, Harrisburg and Baltimore, as mentioned elsewhere in this series of articles. And fortunately, also, the writer has had the opportunity to "feel out" veteran foremen on this important problem.

This series is a manual on the subject of foreman training, and as such is replete with valuable suggestions for the installation of a foreman training course in the paper industry.

Part two contains five chapters, of which this article is the second. "Organizing the Foremen's Conference" will appear in the next issue.

The author of this series is available to answer any inquiries regarding any phase of foreman trainng on which the reader might wish to be enlightened.

Acquiring Background

It can hardly be said that the inside man has the advantage over the outside man in that he possesses an intimate background of plant experience upon which he can draw for his conference discussions. Many concerns prefer outside men as leaders of conferences, and the fact is that in most plants where such foremen conferences have been held the past several years the work has been done under the direction of men especially brought to the plant for the purpose. Thus, the most successful foremen training work now being done in the paper industry is by Mr. R. W. Jenkins with groups of foremen from Ohio paper plants. Before he got into the work several years ago, Mr. Jenkins was a total stranger to the paper industry. But he was a trained teacher. He attended the training conferences held in Minneapolis. As he went along with the work of training foremen from the paper plants he picked up the necessary technical background, which knowledge he supplanted by study of text books on the subjects, such as those issued by the Technical Association of the Pulp and Paper Industry.

What he lacks in intimate knowledge of plant operations and organization, the outside man often makes up for by bringing a fresh viewpoint to the plant, based on experience in a variety of plants and industries, and it is just this fresh viewpoint that contributes most to the successful conference.

So, the greatest problem facing the leader is acquiring a background of plant information upon which to plan his conferences. This is often such a difficult problem that veteran conference leaders have come to the belief that the minimum effort expended in acquiring background in the particular plant, the more effective will the leader's work prove. They maintain that a prospective leader discovered busying himself around the plant, interviewing executives and stealthily or openly taking notes of men and machinery, will immediately arouse the suspicion and open antagonism of the foremen, who will jump to the conclusion that the conference is being used to exploit a nefarious purpose. They also maintain that such tactics are the last resort of the inefficient leader; that the experienced man need have only a general outline of the organization and products of the company, which can easily be obtained by daily contact with the executives and foremen and perusal of the company's literature. Other specific information the experienced leader can learn directly from the foremen as the conference progresses. After all, the leader is presumed to bring teaching, knowledge and organization, and it is left for the foremen to bring

up definite details which the leader is to help them analyze.

If the plant is alien to him, and he must dig for material, then the leader should spend as little time as possible in the quest. Some leaders say that one or two hours are sufficient. There are other methods open to him other than visits to the plant: the use of questionnaires and the conduct of a survey. The survey method in connection with the conference has been discredited, also on the grounds that it will arouse the suspicion of the foremen—foremen are always antagonistic toward so-called efficiency experts, and no man suspected earns their mercy. The questionnaire method also arouses antagonism, but if practiced with tact it may bring good results.

Overcoming Antagonism

For the prospective conference leader, be he an outside man, or one drawn from one of the departments in the plant, who finds it difficult or utterly impossible to get along without fuller information, there are two sensible solutions. One is for the leader to arrange for the appointment of a committee by the foremen interested in the training to learn for themselves the needs, and after these men have done their own investigating to invite the leader to the plant for further research. The other plan is for the leader to secure the co-operation of one of the foremen, or an official of the company not too high above the foreman in rank, to lead those portions of the conference in which highly technical phases are to be discussed, under the personal guidance, of course, of the leader. This plan has been used successfully by Mr. T. E. Jones of Cleveland. Mr. Jones recently told the writer that this method has never failed to work out successfully.

The objection will naturally arise that it is poor judgment for a leader to display his ignorance to his men. But under the circumstances that is the very thing that man should do from the outset. If he assumes too much, and if by any chance he slips in his assumption, confidence in him slips also. The men should be made aware from the beginning that they know more of the technical than he does, and, that he is there to help them bring it out. Such an admission is often an asset to the leader, for it will invariably arouse the job pride of the foremen and they will take to the discussions with more interest. For the same reason, the leader should not attempt to minimize the educational capabilities of the foremen, nor in any way display their weaknesses as foremen.

The Operating Sheet

When the group has been definitely organized and the necessary background obtained, the leader starts out to plan the meetings. The order in which the subjects are taken up and the number of meetings to devote to each subject depend on the nature of the industry and the problems faced in the particular plant. Another factor to take into consideration is that, in order to obtain and hold the interest of the men in the discussion, certain topics, important as they may seem at first, must be held over for later discussion, the most interesting and the most intimate problems being given preference for the initial meetings. Thus, job analysis, which is regarded as one of the most important topics for discussion, is seldom taken up during the first few meetings. Experienced leaders advise that such topics as orders, carelessness, leadership, methods of promoting interest among workers, and the elimination of accidents, are the most acceptable ones for the initial meetings. Job analysis can be introduced at a later meeting, when the foremen's interest in that subject has been sufficiently aroused, especially in connection with the subject of job instruction.

In a paper plant where the greatest need, in the judgment of the leader and the management, is more co-operation between departments and of the men, it might be advisable to set aside several meetings to discuss that phase. It is a matter for the leader to decide for himself, and he may make any changes in his original schedule as the men display more interest in one topic as against another to which he had originally attributed greater importance. The winning virtue of a plan is flexibility.

Thus, at the Bemis Bros. Bag Company plant, the following schedule of meetings was arranged for the conference: One meeting—The Foreman's Place in Industry and the Foreman's Job; one meeting—Orders, Directions and Suggestions; one meeting—Departmental and Job Analysis; one meeting—the Distribution of Supervision; two meetings—Production Difficulties; one meeting—Instruction; two meetings—Interest and Satisfaction; one meeting—Co-operation.

For each meeting or set of meetings dealing with a single topic the leader draws up an Operating Sheet, on which he records briefly the objective desired during the session. This Operating Sheet the leader follows as closely as is expedient. A sample Operating Sheet used by Dr. F. T. Struck, leader of the foremen's conference at the A. M. Collins Manufacturing Company plant in Philadelphia, in connection with the subject of "The Foreman's Job" is here reproduced:

Subject: The Foreman's Job.
Objectives:

1. To give a brief description of the nature, purpose and scope of the conference.
   a. By whom the conference was called.
   b. By whom arrangements were made.
   c. Our purpose in participating.
   d. Nature of the meetings.
   e. General purpose of the meetings.
2. To illustrate the conference method by drawing out the men regarding their major responsibility.
   a. Bring out the difference between a "work"

job and a "responsibility" job.

b. Bring out the difference between a supervisory job and a managerial job.

c. Classify the foreman's jobs under the following heads: 1. Supervision; 2. Management; 3. Instruction.

3. Define terms used.

4. Discuss specific cases in order to make the principles involved as concrete as possible.

Following the Drift

This sort of plan, it should be understood, is only a means to an end, and should be changed if the occasion so requires. This position was clearly stated at the conference of leaders in Minneapolis in the following words:

"This tendency to over-plan, or plan too much in detail, is particularly noticeable in the case of people who are well trained in the technique of teaching, because their natural tendency is to feel that something equivalent to a well worked out lesson plan must be prepared for carrying on a conference. If the progress of the conference is to be based upon free discussion, and the pooling of experiences, it is evident that while general objective can be kept in mind and can, in general, be put over, the general progress of the conference must largely follow the particular lines which develop through such free discussion."

There is more than one good reason why the leader should plan out the conference in advance. For one thing, he has something "up his sleeve," so that if things do not happen speedily enough and the foremen respond coldly, he has sufficient ammunition in front of him to warm up the battalion.

"But," says Professor MacDonald, of Ohio State University, an experienced leader of conference, who has also trained many successful ones, "he should not be too hasty about suggesting, so long as extracting ideas from them is not too laborious. It must always be borne in mind by leaders that in proportion as the members of the group contribute in like proportion is self-improvement taking place."

"It is not easy," says Mr. Frank Cushman, who has led many such foremen conferences for the Federal Board for Vocational Education, "to hold back and let a group of men bang around on an elementary question. However, it is necessary to do so in order to give the men time to think their way through to a sound conclusion."

Stimulating Discussion

At the Harrisburg conference of training leaders from paper plants and other industries, one of the men put the following question: "How can you draw out the reluctant man in a conference who is slow of speech, but who has a wealth of content to contribute?" The answer to this question, as stated by an experienced leader, proved so illuminating that we will quote it in this connection:

"The leader should study this situation and draw the man in as best he can. If the leader is an outside man he might quietly, outside of the meeting, give the man a tip to help the conference along, or in the meeting he might address the person, by saying, 'Say Bill! You know something about this, how about it?' It is necessary to observe the psychological time and to avoid embarrassing the man by asking questions that he may not be able to answer. Sometimes it is necessary to size the man up because no two human beings are alike."

There are moments during the conference when expediency makes it necessary for the leader to turn teacher. The successful leader must be prepared for this job. This point is arrived at when the foreman had been made to analyze cases put before them and which they themselves have introduced, and then, to make the instructional process final and effective, the leader must size up to the occasion by adding from his own stock of knowledge to help the foremen formulate their viewpoints. But, as has been pointed out, the leader must so conduct his instruction process that the men do not regard it as purely teaching, in which case their latent antagonism might come to the surface.

The leader must always be ready to come to the aid of the men by bringing up definite problems which he has gathered from the experiences of other plant organizations. He should be armed with a sufficient number of such cases. Then, when he has introduced a question and a typical case, and the men still do not respond as he would like, he mentions other cases, of a similar nature, until the suggestive process accomplishes its ends.

Therefore, it is not always the inside man who is most successful in leading conferences. The outside man, possessed of a wide knowledge of instruction methods and experiences, can readily draw from his observations in other plants.

One way for the conference leader to improve his knowledge of the conference process is to watch the conduct of similar conferences in other plants and by comparing experiences with other leaders. Fortunately, there have been organized efforts for such interchange of experiences, with the result that in the past few years a definite pedagogy of foreman training has been formulated.

The principles underlying this new pedagogy of foremen training will be explained fully in subsequent articles. By drawing fully upon discussions developed at many conferences the writer will illustrate the practical application of these principles. For the executive in the paper and paper products plant undertaking the formulation of a foreman training program, and even for the foremen participating in such a program, the articles will therefore serve the purpose of working sheets to which they can refer in planning and conducting the foremen's conferences.

Eliminating Waste in Paper Mill Supplies

By P. G. RINER

To anyone wishing further information on modern warehouse methods or the installation of a salvage department, the author is available through THE PAPER INDUSTRY *and will be glad to answer inquiries.*

MR. HERBERT HOOVER'S report of January 14th to the current National Distribution Conference gave fifteen sources of waste in American business. One of these was the "multitudinous waste of materials."

Since the war almost every American industry has been putting on a campaign to eliminate waste. The paper industry has been no exception. One phase of practically all of these campaigns has been the elimination of waste in stockroom materials and supplies.

Modern Warehouse Methods

One important factor in helping to eliminate material waste is a modern stockroom with up-to-date warehouse methods. Many may think it unnecessary to mention the importance of a modern stockroom, believing that all paper mills realize this and have organized such a department. However, I think I am safe in saying that seventy-five per cent of the mills do not realize its importance and have not a modern stockroom.

A stockroom by having a good stock of mill supplies and repair parts can also eliminate waste of time and production. Most any paper mill foreman can tell how a shutdown was avoided or reduced to a minimum because of a repair part being kept in warehouse stock. This same man can also tell of hours wasted by millwrights and maintenance men because the warehouse did not have the necessary repairs and a makeshift had to be made. No warehouse ever had or ever will have everything wanted when wanted, but one with up-to-date methods will find out if the breakdown was unusual or a regular occurrence and build their stock accordingly. It is often found that an article of small value may save thousands in production value. For instance, the lack of a set of contact fingers or shoes for a motor compensator worth very little may cause a shutdown of a motor driving an important unit of the paper machine.

Salvaging Material

A salvage department if properly operated and supervised can probably do more toward elimination of waste in paper mill supplies than any other department. Every mill, regardless of its size, should organize such a department which operates in conjunction with the warehouse or stockroom. The supervision should also be under the same superintendent. I find that nearly all paper mills have much the same habits which cause waste. For example, it seems like a regular occurrence to change motors and other machinery drives; to rebuild conveyors and to change stock and water lines. When these changes are made, ordinarily the old material is thrown out and new material goes in. This is particularly true when the changes are made on Sunday and there is no time to recut the old material. Perhaps by briefly outlining how a salvage department operates it can more easily be shown how waste is eliminated.

All material, regardless of its nature, is tagged with a colored salvage tag and delivered to the salvage department. This tag is filled out, giving the name of the article and states whether it is to be "scrapped," "sold" or "held in storage." The tag is dated and signed by the department foreman delivering the material. If the article is a lathe, for example, the tag would state the foreman's views, whether it was of no use and should be scrapped, whether he wanted it sold and given credit, or whether he wanted it stored for a while, planning on putting it into use later. If it is scrapped the department delivering the lathe is credited with the market price for scrap iron minus an estimated cost, if any, for dismantling the machine. If sold as a second-hand lathe, the department is credited with the selling price minus a small amount for cleaning up the lathe and getting it in saleable condition. If the material is stored, the department is not given credit for it and does not issue an order when drawing it out.

If the material is just an accumulation of miscellaneous items such as bolts, valves and fittings, the tag would probably read "scrap." That would not necessarily mean that it would be thrown in the scrap bin, but the salvage man would go over each piece and reclaim all that he could. Credit would be issued to the department delivering the above material at the prevailing market prices for scrap iron, scrap brass, scrap copper, etc. The bolts are rethreaded and oiled; the fittings are tested, painted and threads cleaned with pipe taps; the valves are cleaned in acid, new seats or stems are put in and then tested. All articles which are stock items with the warehouse are delivered to the receiving clerk and checked in; the salvage department being given credit for one-half of the cost of new material. The receiving clerk when putting the material away in bins, tags or marks the material in such a way that the window clerk will know that it is salvage material when giving it out. He marks his window order "salvage" and the stock clerk subtracts the item from his stock card and prices the order at half price. The foremen, while they sometimes feel that are not getting enough credit when delivering the material to the salvage

department, soon learn that they can operate their department for one-half by asking for salvage material when calling at the warehouse window. The window clerk is also instructed to move salvage material first in preference to new stock except in a case where the man drawing the material explains it is going in an unusual place or on high pressure lines.

If the material is not stock but has more than scrap value, it is kept in the salvage shed. Such items as pillow blocks, shaft hangers, large fittings and pulleys are usually listed and numbered so the master mechanic can have a list and use up the material. This material is also given out at half price, but it is never charged against the warehouse stock or entered on the stock cards, but credit given direct to the salvage department when withdrawn.

All new material drawn by the salvage department in the shape of repairs, valve parts, paint, tools, etc., is charged to that department. Each department is sent a salvage statement, the month showing the amount it has been credited with by the salvage department. The salvage man is also given a statement showing his cost for operating his department. A monthly recapitulation sheet is made up showing on the one side, first, the cost of operating the department, including such items as wages, tools, etc., and second, the total amount of credit issued to the various departments delivering material. On the credit side would be, first, the total amount of credit issued to the salvage department for material delivered to the warehouse for stock; second, the total amount of credit for material delivered direct from the salvage department to the various departments in the mill; third, the total amount for material sold to individuals and companies such as scrap iron, scrap felts, scrap canvas, etc. As stated before, if this department is properly operated and supervised it should bring a net profit anywhere from two hundred dollars to a thousand dollars per month, according to the size of the mill, besides each individual department being able to reduce its operating cost.

Anilines

By B. T. McBAIN

I BELIEVE there is one more subject on which I have not yet touched either in my series of talks on Waste or my new topic Savings, and that is Aniline.

Of course, in general, I have often referred to this important topic, but it has not been given the attention that its importance warrants.

Well do I remember an order from a well known fibre reed furniture factory in Michigan calling for a certain shade of brown. Our experienced men in matching colors matched the shade almost the first thing, but at different times during the run, without any explanation whatever, it would run off a shade or two and would then come back. Of course, we were using deckered stock, both kraft and sulphite, and a change in consistency in the filling of a beater, especially on this deep shade, made a difference. We checked up on this even to the point of using all lap stock on one whole run and weighed every pound used in each beater, but still we were off. We tried everything else anyone and everyone suggested, but without correction.

We experimented this way and that, and yet our color was off, and each shipment caused complaint. We finally lost the order, but our quality in every other respect was so much better than that supplied by others that we were given another trial.

This time we sent to one of the large color manufacturers and told them our troubles. They gave us the answer immediately. We were using two different kinds of colors which should not be used together, and on using the new formulae they supplied us, our troubles were not only over, but our color cost on the order materially reduced.

The large aniline manufacturing firms maintain laboratories not only for their own direct benefit, but for the benefit of their present and prospective customers. These laboratories are manned by experts in the color and pulp and paper game. They are not only acquainted with their own problems, but know theoretically as well as practically what they should expect to encounter in the beater room, and on the paper-making machine. These concerns offer this service to the pulp and paper industry, and it is too bad that those in the industry do not take advantage of the same more than they do, for it is not only a great benefit to the industry and to the trade generally, but in many instances the mills will save a considerable amount monthly by the use of the proper combinations of colors for the manufacture of orders in hand.

Of course, there are superintendents who will claim that they cannot get results from this color and from that made by one certain firm; there are other superintendents who say they don't want any of those young kids from the aniline laborary coming around and trying to show them how to do what they have known how to do for years before they were born.

I remember in my experience a steam engineer who could not use Standard oils in the cylinders of his engines. He could hear them groan whenever he was forced to use that oil. It cost only 50c per gallon, while the kind he wanted, one of those with a fine high-sounding name, cost nearly $1.00 per gallon and did no more or better work. I tried him out. After buying a barrel of the "groaning oil," I emptied it into a barrel marked with the fine sounding high-priced name. He did not know the difference and ever thereafter he used Standard oils with the saving mentioned.

I know we all are prone to have prejudices of one kind or another—I do not like one thing—you do not

like another, but when it comes to savings at our work, we should pass up all our own petty personal prejudices, and work for the good of the industry as a whole and our own mill in particular.

I know from experience that the large aniline manufacturers can and are willing to render your mill a valuable service; they have the equipment, the men and the desire to render this service, no matter how large or small your color bill. It is up to you fellow superintendents to have. Why not begin on color right now?

Cleaning Up a Pulpwood Storage Yard

THE superintendent of this pulpwood storage yard has used excellent sanitary measures in the effort to reduce preventable decay in the yard to a minimum.

The top picture shows a condition which was once prevalent throughout the yard. Pulpwood was close-piled directly on the ground. No provision was made for air circulation to take up moisture liable to incubate decay, no attempt was made to clean up the decay-favoring litter of bark and rubbish, and no effort was made to insure quick disposal of surface water after rain or spring thaws.

Photographs by Forest Products Laboratory, U. S. Forest Service.

The center photographs show steps in bringing the yard to a sanitary condition—at the left the bark and debris piled for removal and at the right the manner in which the yard was graded to insure proper drainage.

The lower photograph shows the clean, practically weedless condition of the ground after the yard had been cleaned up, and the provision made for air circulation beneath the piles.

What Does Your Groundwood Cost?

Part III

By ADOLPH F. MEYER
Consulting Engineer

IN COMPUTING groundwood costs, the cords of rough wood used constitute substantially the correct measure of input. When the size of pulpwood used in different mills varies greatly, or when sawed wood is used as in the West, these elements must be taken into consideration, and under such conditions solid volume is a more accurate measure of input.

Various recent investigations have shown that for the normal run of pulpwood used in the mills, the moisture content is about 40 per cent. Little shrinkage occurs in pulpwood until the moisture content is below 25 per cent, which is drier than wood gets in the ordinary storage pile. Most pulpwoods contain about 25 lbs. of bone-dry substance per solid cubic foot. Volume measure reduced to solid contents may fairly be compared with tons of fiber produced.

Where rossed wood is measured in the grinder room, barking losses are known; although, when frozen green wood is run through drum barkers, it often comes out so broomed that the true loss in barking is not shown by the rack measure.

The power used in the production of groundwood should be viewed from two angles when operations in different mills are to be compared; first, the actual mechanical power required **on the grinder shaft** to produce a ton of pulp or grind a cord of wood (character of pulp to be measured as suggested in a previous article), and second, the cost of the **water power**, or its equivalent, required per unit of output.

From the viewpoint of desirable grinding pressures, types of pulp grinders, types of burrs, temperature of grinding, and similar elements, we are concerned with the actual mechanical power consumed at the grinder shaft, and not with the true power **imput.** Where motors are used the kilowatts consumed by the motor should be decreased for motor losses. Where waterwheels are used the manufac-

turer's horsepower rating for a given head and gate opening should be decreased for losses in power due to running at incorrect speeds **unless governors are used.** Holyoke test data for eight typical waterwheels indicate that these wheels when running 15 per cent overspeed, produce, on an average, 13 per cent less power from the water used than if they ran at their most efficient speed.

Judging from the writer's experience in installing governors on waterwheel-driven grinders in more than fifty mills in the United States and Canada, the waterwheels driving one, two, or three grinders on a line (2 ft. wood) where pressure regulating valves are used, lose from 10 to 15 per cent of their rated power. Where four or more grinders are connected on a single line the loss is from 7 to 10 per cent. Where pumps driven from the individual grinder-line shaft are used to supply grinding pressure the power loss is about 3 per cent less than where pressure regulating valves are used. Where exceptionally good grindermen are employed the losses also are slightly less.

From the viewpoint of power costs, the entire hydraulic power consumed, per ton of output, as determined from the type of waterwheel used, and the head and gate opening, irrespective of power loss resulting from incorrect speeds, must be the basis for computation.

Where motors are used for driving pulp grinders, the power cost must take into consideration all power losses between the waterwheels of the hydro-electric plant and the pulp grinders, namely, generator, step-up transformer, transmission line, step-down transformer, and motor losses, or as many of these as are applicable to the given plant. For every 100 water horsepower, about 60 mechanical horsepower are delivered to motor-driven pulp grinders as against about 85 mechanical horsepower delivered to **governed** waterwheel-driven pulp grinders.

After computing the quantity of power consumed in pulp grinding, taking into consideration the elements to which attention is called above, and applying the proper fixed and operating costs for all the equipment used in supplying this power (or the proper prorated portion thereof) power costs will be secured that are comparable. On the other hand, when comparing quantity and quality of output produced under different grinding conditions only the actual mechanical horse power consumed by the grinder should be used as the basis for comparison.

Cost and Factory Accounting—Part X

By H. M. GRASSELT
American Writing Paper Company

Cost and Factory Accounting is a series of articles dealing with this subject which has been running in the columns of THE PAPER INDUSTRY *for some time. The preceding chapter was published in the December, 1924, issue. It will be noted that references are made to figures and tables in these previous numbers. Concluding chapters will be published in succeeding issues.*

THE FIRST side of the Rough Production Order (Fig. 6d), illustrated in the preceding article, gives an itemized account of the total cost of rough paper made on a specific production order. In checking the rough paper production on a particular run against the net weight of its furnish, allowance has to be made for a certain percentage of invisible waste caused in the processes of beating and machining. The invisible waste will, of course, vary with the character of the furnish components.

Continual observations of effects enable the manufacturer to determine with reasonable accuracy the percentage of invisible waste in his various furnishes and to establish a definite figure for each grade of his paper for guidance in cost work. With a fixed percentage of invisible waste available, a proper alignment of furnish weight and rough paper production may be easily attained.

The few forms used in connection with rough paper department activities should not merely be used as statistics or records of incurred expenses. They should be regarded as indicators of machine room efficiency; they must point out defective features and give a clear and comprehensive account of performances and results. The cost man, whose duty is to work on those records, should not mechanically enter the various items that go and make up the cost of a certain run, but discuss with the superintendent every morning any irregularities, such as excessive broke, production below the established standard rate, etc., that may be brought out by the daily cost and production records.

Finishing Department

All finishing room operations and cost data that cover them are also in this department recorded under the same production order number on which the paper was run on the machine. Figure 6c, Finishing Order, will be recognized as the lower part of the second carbon copy of the Production Order (Fig. 6, Installment VI, September, 1924, issue). Instructions as to finishing, trimming, wrapping and shipping, date promised, etc., are inserted by the order clerk, and the superintendent will forward that copy to the finishing room foreman at the same time he passes

the original of the production order to the machine tender and the first carbon copy to the beater engineer. The superintendent will state the date on which he expects to make that particular order on the finishing room foreman's copy, so that the latter may plan his work accordingly.

To facilitate immediate identification of any lot of rough paper and to prevent mistakes, the machine

FINISHING DIRECTIONS:

Shipping Directions: Date promised:.....

Customer:.....

C/L L/C prepaid or collect.....

Routing:.....

Quan. Made		Date Fin'd.	Quantity Finished								
			Perfect				M's				Broke
Rolls	Lbs.		Gross Actual	Net Actual	Nom.	Rms.	Gross Actual	Net Actual	Nom.	Rms.	Actual

Fig. 6c. Finishing Order. (Lower part of second carbon copy of Fig. 6)

tender has provided every roll with a machine ticket; that is, a small printed form in which the production order, grade and color of paper, size and weight, date made and a few other details have been entered. For further quick locating of any lot, the production order number is written in large figures on the roll, together with the exact weight of the same.

The form Summary of Cost of Machining and Drying (Fig. 13) provides a permanent record of paper machine activities. Its purpose is to record for every working day for a cost period all paper machine operative hours, cost of tub sizing and drying as well, recovered machine broke and net weight of rough paper production. The form exhibits in a concise manner manufacturing experience and details pertaining to paper machine efficiency and activities. Its summarized data permits of quick comparison of results to past performances and records and shows at a glance whether the paper machine has been running at full capacity and attained the required normal standard production per operative hour.

Tub Sizing

The Daily Machine Record (Fig. 11) has a column provided for the entry of tub size. The strength of the solution is expressed in degrees Baumé. If, for instance, for a particular tube size solution, the factor is found to be .85 and the strength 3.5 degrees Baumé, the latter figure is multiplied by the factor, and the product represents the number of dry pounds of size which will be retained by hundred pounds of paper. In the case mentioned, the retention of dry glue is 2.98 lbs., giving a final weight 102.98 lbs., or in round figures 103 pounds of dry, tub sized paper. The total number of pounds of tub size retained in a certain run of paper is thus easily obtained.

Records of Wires, Felts, Etc.

A cost system requires reliable records of wires, machine clothing, jackets and aprons, and reporting of issues from stores. Wire and felt manufacturers furnish consumers with excellent record books for those items, and it requires only a few minutes of the superintendent's or machine room foreman's time to keep the records in order. It is essential to enter the incoming materials promptly and cover every issuance by a requisition on stores. It is obvious that the life of a felt or wire should be correctly reported. If possible the tonnage of paper made on a wire or felt should be entered opposite the time of service, so that the cost of paper per pound for such renewals may be determined.

Proper storage and care of wires and felts are subjects too well known to require a detailed description in this place. Every superintendent and machine tender knows that adequate storage and careful treatment of wires and felts will prolong their serviceableness and aid in the reduction of production costs.

Idle Time

An ideal industrial condition would exist if a paper machine could be run year in and year out at the full capacity of 144 hours a week. However, there are certain contingencies that render improbable uninterrupted operations throughout the whole year. The manufacturer will, therefore, base his predetermined departmental rates upon a certain actual annual operating time, which he has on hand from past records and performances and may safely assume to be his normal operating time. In many fine paper mills an annual actual operating time of 6,000 productive machine hours may be considered as normal and taken for the basis for standard rates. These 6,000 productive hours carry, of course, the annual total burden allocated to the Rough Paper Department and prorated to the individual paper machines according

to their respective width. Hence, if a paper machine runs less than 500 productive hours in a month, the cost of that inoperative contingency represents the unabsorbed manufacturing expense or cost of idle time. This procedure is used in mills with a budget cost system, and a detailed description of its principal features—standard production, departmental rates, idle capacity, overabsorbed and underabsorbed manufacturing expenses, etc. — has been treated in an early installment of this series.

Machine Rolls

Before concluding the subject, Rough Paper Department, and proceeding to a description of finishing costs and operations, brief mention will be made of rough paper in rolls and their proper condition and handling between paper machine room and finishing department. Condition and handling of machine rolls constitute a very important contributory factor to efficiency in subsequent finishing operations. The final cost of the paper is very often quite unnecessarily increased by excessive finishing broke—the result of poorly wound and spliced rolls and careless handling in inter-factory transportation.

Very often machine room help treats the rough paper rolls worse than the proverbial furniture mover in the comic strips his victims. Rolls are thrown around in any old way, bumped on edges, rolled on wet or dirty floors, often opposite to the way the paper is wound. When unloaded in the finishing room the roll is frequently pushed off the truck with one end ahead and thus many an edge is damaged and many a layer of torn or bruised paper has to be stripped off the rolls before they are put into the calender or cutter, whatever the case may be.

Aside from external damages, much harm is done by poorly wound and inadequately spliced rolls. In an imperfectly wound roll the strain is unevenly distributed and causes uneven tension in the calenders and cutters, resulting frequently in breaks. Splicing is often done in a most careless manner; in many cases the splicing tape overlaps the edge of the sheet with the gummed side sticking fast to a few layers of paper. Sometimes paste is used instead of sealing tape, and often in such quantities that a goodly portion of it is squeezed out and runs down the ends of the roll, thereby spoiling many pounds of otherwise perfectly good paper.

Very often a manila or gray sealing tape is used for splicing white paper. Colored sealing tape has no place in white paper that is to be reused in a future furnish for white paper. Breaks must be properly flagged.

Now and then one of those antiquated hand trucks with a sharp, iron toe blade is still found in mills. While short rolls may rest wholly within the body of the truck, larger rolls overlap on the iron blade and dents and cracks in the paper are the common result.

These are just a few of the principal causes of damages to rolls. A check-up on the matter and increased attention to all details involved will doubtless result in a substantial reduction in finishing room broke. An old superintendent, an arch-enemy of all preventable waste, remarked recently to the writer, remodeling an ancient proverb to fit his case, "In a paper mill the way to ruin is covered with broke." More truth than poetry, but it covers the subject rather thoroughly.

SUMMARY

Month of.....192..... Cost of Machining and Drying Daily Machine Reports Loft Reports

Date	Prod. Orders	Paper Machine No. 1				Prod. Orders	Paper Machine No. 2				Tub Sizing Total		Loft Total		Machine Broke Recovered		Net Wt. of Rough Paper
		Total Hours	Total Pounds	Cost Total	Cost Per Cwt.		Total Hours	Total Pounds	Cost Total	Cost Per Cwt.	Pounds	Cost	Pounds	Cost	Pounds	Value	
Totals																	

Figure 13

Editorial Comment

By WILLIAM SIBLEY

Cash Value of an Education

ACCORDING to Dean E. W. Lord, of the Boston University College of Business Administration, a high school education is worth $33,000, and the cash value of a college or technical school training is $72,000.

Says Dean Lord: "Consider first the untrained man. He goes to work as a boy of fourteen, and reaches his maximum income at the age of thirty. This maximum is, on the average, less than $1,200 a year. Since his income is largely dependent on his physical strength and manual dexterity, it falls off at the age of fifty or earlier, to a point below the level of self support. More than sixty out of every 100 untrained workers are dependent upon others for support at the age of sixty.

"The man's total earnings from fourteen to sixty are about $45,000. The significant fact is that not more than $2,000 is earned during the four years that would have given him a high school education.

"Second, take the high school graduate. He goes to work at eighteen, having lost the opportunity to earn the $2,000 during this period which the untrained man earned. But starting at eighteen, he passes the maximum income of the untrained man in seven years, rises steadily to his own maximum of $2,200 at forty years; and continues at that level for the rest of his active life.

"His total earnings from eighteen to sixty are about $78,000. The $33,000 more than that earned by the untrained man represents the cash value of a four-year high school course.

"Thirdly, consider the college or technical school graduate. His permanent earnings begin at twenty-two, although a considerable amount may be earned during the college course. By the time he is twenty-eight, his income equals that of the high school graduate at forty, and it continues to rise practically without a break.

"Since his income is dependent upon his mental ability and training, constantly improved by practice, it increases instead of diminishes with the years. The college or technical school graduate's income of $6,000 at sixty years is often surpassed.

"His total earnings from twenty-two to sixty, not including anything earned during the college period, are $150,000. The $72,000 more than that earned by the high school graduate represents the cash value of college or technical school training."

Intensify Sales Effort Now

ACCORDING to the United Business Service, "now is the time to expand sales effort."

Their analysis shows that the whole country, with a few isolated exceptions, is enjoying an increasing trend of business activity which they believe will continue throughout the first half of 1925 and will ultimately approximate a gain of 15 per cent over the business done in the first half of 1924. The "isolated spots" on their sales map for February are shown to be the Rocky Mountain states, Vermont, New Hampshire and the eastern portions of North and South Carolinas. The "best" states are those located in the industrial or manufacturing districts, the "corn belt" and the five states bordering the Gulf of Mexico. Maine, the southwestern states and the Pacific Coast, together with Tennessee and Kentucky, are shown to be in the "next best" classification.

Their February 15th forecast says: "Sales executives should fully realize that oversupply and foreign competition have not said a final good-bye. Expansion in all lines is going on rapidly, and there is at least a possibility that June or July may usher in a much less favorable combination of sales conditions. We, therefore, recommend broad and extensive selling effort the coming few months, with particular emphasis on direct mail and other types of selling that will cover a considerable territory in a short space of time."

Foreign Trade for 1924

OUR best customers are, in the order of their importance: Great Britain, Canada, Germany, France, Japan, Cuba, Italy and Holland. Only during 1924 did Great Britain take first place; since the Civil War, Canada always holding first place as a "foreign" customer for American made goods.

The foreign trade of the United States during the past year amounted to $8,200,698,000, which was an increase of almost a quarter-billion over 1923. This foreign trade was divided into exports: $4,590,146,000, and imports: $3,610,552,000.

Those countries from which we chiefly import are, in order: Canada, Great Britain, Cuba, Japan, Brazil, Mexico, Straits Settlements, France, Germany.

Superpower Rapidly Developing

SUPERPOWER is a scheme for the co-ordination of all major central station power units over a wide area. It is merely the application of common sense principles and sound business practices to the power production problems in manufacturing areas of the United States. The outstanding advantages to be gained by linking together the individual electric power producers is to afford the hydro-electric plant an opportunity to market the surplus power developed during flood times into areas served only by steam plants, as well as to protect those depending upon hydro stations in time of draught. Another

—— on Timely Subjects

advantage will be the cheapening of production costs to an extent where the individual factory will find it more economical to purchase central station power than to develop it.

Most outstanding has been the development in the electric power producing field. Twenty-five years ago the production stood at about 300,000 H. P., while today it is in excess of ten millions,—an increase of over thirty times. According to the U. S. Geological Survey, the yearly average of mean daily production in millions of kilowatt hours, is: 1919, 107; 1920, 112; 1921, 120; 1922, 131; 1923, 153; 1924, 166.

A New Use for Radio

AT THE National convention of the Socialist party, held in Chicago, February 22d-24th, one of the speakers introduced a resolution which was, in part, as follows:

"Resolved, that this is the sense of the National convention that it is imperative that one or more stations should be forthwith provided for the propaganda of liberal ideas, political and economic, and that ways and means should be found to provide a suitable plant or suitable plants for the radio broadcasting of such ideas free from Wall Street control and censorship; and be it

"Resolved, that the National Committee be and is herewith empowered to secure data on the cost and expense of installing and maintaining a suitable radio broadcasting station, and to enter into contracts for the necessary equipment, and be it further . . ."

Radio is our greatest means for publicity. Publicity is light shed on every angle of a question. Propaganda is light concentrated on only one angle. Radio should be kept free for true publicity—be it religious, political, economic or social subjects. Using radio for propaganda purposes will make its usefulness short-lived.

Consensus of Opinion on General Business

Babson:

While in the retail trade in general, and in some manufacturing, there has been lagging, the fundamental trend is upward.

Alexander Hamilton:

This present period of trade revival promises to last longer than that which ended in the spring of 1913—particularly if present conservatism continues.

Brookmire:

Great and sounder stimulus to primary activity should be seen during the first half of 1925 than any which occurred in the post-war period.

Harvard:

Although a boom is not impossible, the present outlook is for moderately improving business.

Bankers Economic:

Although hand-to-mouth policies still prevail, the total amount of buying for spring appears to be large.

Moody:

At no time since 1914 has the stage been so favorably set for genuine business prosperity.

Putney:

During the first half of 1925, good business may be expected, but there is still a question as to whether it will develop into a boom.

United Business Service:

Good business is expected during the first half of this year. Beyond that, improvement depends on circumstances not yet determined.

Standard:

Altho business is going ahead at a pace too fast to be long maintained, there should be no slackening for a few months.

1924 Building Activities Exceed All Previous Records

1919	$1,492,947,000
1920	1,608,036,000
1921	1,869,327,000
1922	2,764,077,000
1923	3,391,904,000
1924	3,547,252,000

The above figures represent the value of building activity over a period of six years,—last year's construction work breaking all previous records.

In view of the fact that our building activity has shown a steady increase (in spite of periods of depression, minor and major) it would seem that some revision was needed to the theory that the war was entirely responsible for the building shortage. We would rather believe that our normal, pre-war expenditures for buildings which ranged about one billion dollars annually has been permanently raised. This could be due to two major factors: the increasing population in cities and towns (now totaling 63 per cent of our total) and the demand for a higher standard of housing along with the general lifting in standards of living.

Census Bureau figures show that more than two million agricultural workers have migrated to the industrial centers since 1910.

Practical Helps for the Mill Man

Preventing Check Valves from Becoming Plugged with Chips

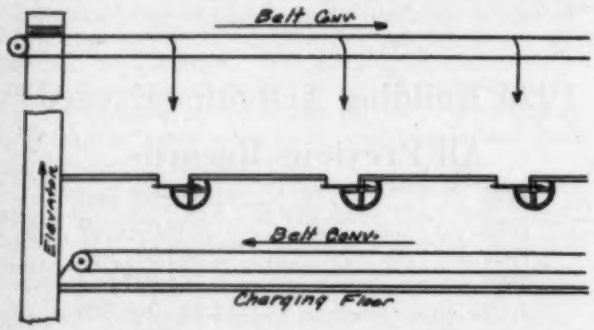
CHECK valves in acid lines or other injection lines leading into the bottom of sulphite digesters are apt to become plugged with chips which are packed back against the valve disc during cooking. When the time comes to make use of this line, the chips packed against the back of the valve disc prevent it from opening and causing trouble generally. This trouble has been effectively remedied by making a small connection from the main steam line to the top of the check valve. This allows a small amount of steam to pass through the top of the check valve during the cooking, which keeps the passage clear and free from chips.

Shaft for Pulp Winder

THE shaft shown in cross-section in the sketch has been used to make easier the removal of the shaft from the pulp rolls as they are taken from the machine. When the roll is started, the small bar is tipped up to increase the circumference. When the shaft is to be withdrawn, the bar is laid back in place, leaving the shaft loose in the roll so that it may be easily withdrawn.

Transferring Chips to Different Points in the Chip Bin

IN PULP mills where frequent changes in wood shortage of chips or other reasons necessitate the cleaning out of the chip bin, rather frequently an arrangement to transfer the chips from one point in the chip bin to another position

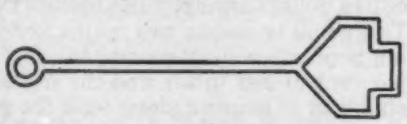


over another digester may be found to be helpful. This eliminates much shoveling and will save time in filling the digester when the supply of chips is low and in the wrong place.

The chips are taken out of the bin through a chute in the usual manner, but instead of going directly into the digester, they are led onto a 24-inch belt conveyor extending the length of the digester room and placed at one side. This discharges the chips into the bucket elevator where they are lifted back into the chip bin and discharged at the desired point.

Tongs to Lift Digester Cover

ONE sulphite superintendent having experienced several eye bolts breaking in lifting the cover uses hooks similar to those shown in the sketch. Two are used for each cover. They catch onto the sides and are lifted by the hoist in the usual manner.

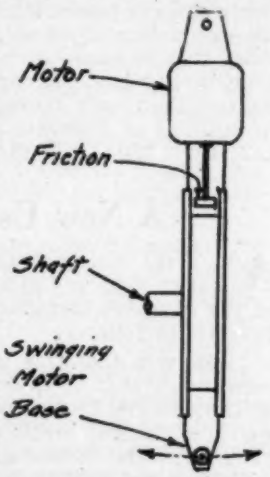


Preheater for Heavy Fuel Oil

IN ONE instance where heavy residual oil was substituted for ordinary fuel oil, the preheating equipment, heating the oil to 180° F. before burning, was not sufficient to give complete combustion in the furnace. Additional heating capacity was accordingly installed by placing a half-inch steam pipe inside the four-inch oil feed pipe, which is covered with insulating material, and is about eight feet long extending across the front of the boiler. This is sufficient to raise the temperature of the oil to 220° F. just before it enters the burners. This simple addition has saved four barrels of oil per day for each 450 H. P. boiler.

Constant Speed Operating Mullen Tester

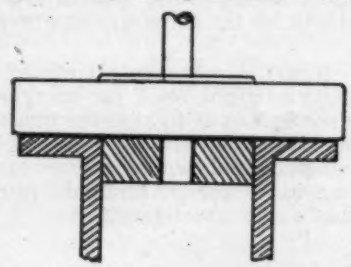
ONE important item in making the Mullen pop test is the operation of the machine at the same speed for each test. It is hard for one person to make the test in exactly the same way each time, and when different persons are making the test the possibility of error is still greater.



To eliminate this possible variation, the simple device shown has been used to give the constant speed. A friction pinion is attached to the shaft of a 1/10 H. P. motor. This comes in contact with a pulley attached to the shaft of the Mullentester in the manner shown. The pulley is attached in the place of the hand wheel. The motor is set on a movable base so that when the friction is swung against one side of the pulley in making the test, the pressure on the diaphragm is steadily increased. When paper pops, the direction is reversed by swinging the contact to the other side of the pulley until the diaphragm is brought back into position.

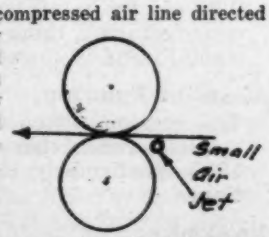
Grinder for Flange on Soda Digester

KEEPING the face of the bottom flange on a soda digester free from furrows caused by corrosion is often a troublesome job. It is important, however, to keep the face of the flange smooth, as otherwise, if this is not kept in shape, there is danger of blowing out the gasket, allowing enough steam and liquor to escape to spoil the cook. Formerly, the only way of keeping this in shape was by filing—a tedious job in an awkward position. This work has been made much easier and done in much less time by using a carborundum wheel attached to a small air motor. The grinder is held in place by inserting a collar carrying a bearing in the neck of the digester as shown.



Keeping Edges of Felts Clean

A SMALL jet of air from the compressed air line directed so that it blows water away from the edge of the sheet and down the side of the lower press roll has helped materially in keeping the edges of the felts dry and preventing their becoming saturated with clay and other material.



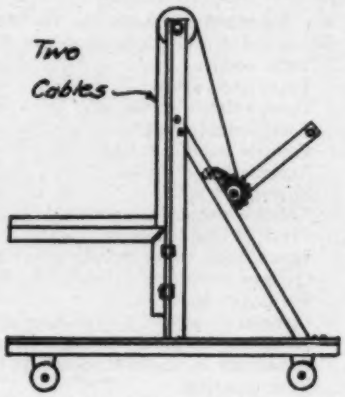
An Aid in Starting the Sheet on Paper Machine

IN TAKING the sheet from the suction couch to the first felt on a Fourdrinier machine, it is necessary often for the operator to keep the small aluminum roll turning with one hand while handling the paper with the other. If the roll

turns at all hard, this sometimes gives trouble in starting the sheet on the machine. In one instance, this has been overcome by attaching a fan to the back end of the roll, which is turned by blowing a small jet of air from the compressed air line against it. By regulating the air valve, the roll can be regulated at any speed desired. This simple attachment has saved much trouble.

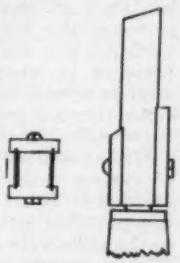
Lift Truck for Placing Blow Valve on Soda Digester

WHENEVER it was necessary to remove the blow valves on the soda digesters for making repairs, which is rather a frequent occurrence, it was customary to handle the valve with a chain block hanging from the top of the digester with a long chain extending down to the bottom. Handling the valve was made much easier and simpler by building a small lift truck similar to the one indicated in the sketch. The small platform, just large enough to hold the valve, is raised to the height of the valve on the digester by winding up the two cables. When the valve is removed, it is lowered to the truck platform and drawn to the shop, making the operation much easier and quicker than by using a chain block.



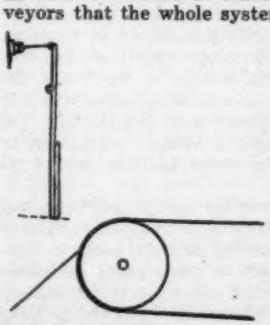
Knife with Double Blade for Cutting Pulp Samples

TIME in cutting samples may be saved by using a double-bladed knife similar to the one shown. The blades, which are similar to a shoe knife, are set in the holder which is held together by the screw. They are set one-half inch apart, which enables the cutting of a standard sample across the roll with one stroke.



Automatic Stop for Wood Conveyors

IT OFTEN happens when wood block or chip conveyors become blocked at transfer points between different conveyors that the whole system will become flooded with chips, plugging elevators and causing trouble generally. In one instance, much of this trouble has been eliminated by attaching a board as shown, so that when the conveyors become blocked, the chips pile up against it and force it back. This pulls out an ordinary two-point slug which breaks the motor circuit, stopping the motor driving the conveyor. This action takes place back along the line of conveyors before any of them become loaded too heavily.



Baby Press Roll Substituted for Upper Press

SHUTTING down completely, or at least greatly decreasing the production of a large board machine for several weeks was averted in one instance when it was necessary to send away one of the brass press rolls for repairs. Wood blocks conforming to the journals of one of the baby press rolls were fitted into the press roll bearings on the machine and the necessary weights put on in the usual manner.

Joseph Wallace, an employee of the Thorold division of the Provincial Paper Mills, was crushed to death while unloading a bale of waste paper, which fell on him.

National Forests Enlarged by New Purchase

The National Forest Reservation Commission has just authorized the purchase of 132,014 acres of land in ten eastern states for additions to National Forests, according to the Forest Service, United States Department of Agriculture.

The average cost of the land will be $5.24 an acre. More than 21,000 acres are in the White Mountains of New Hampshire, and is partly of heavily forested lands in some of the scenic regions.

In Pennsylvania the purchase of 23,320 acres was authorized, thus increasing the area of the Allegheny Forest, which protects the headwaters of the Allegheny River, to nearly 200,000 acres.

Purchases in Southern States—Additions to purchases were authorized in Virginia of 10,578 acres; in West Virginia to 2,500; in Tennessee, 11,559; in North Carolina, 13,033; in South Carolina, 3,046; in Georgia, 39,624; in Alabama, 1,645; and in Arkansas, 5,098. The commission went on record in favor of an appropriation of $3,000,000 for the further purchase of lands for eastern National Forests.

According to W. W. Ashe, secretary of the commission, this brings the total area of lands being acquired for National Forests in eastern and southern states to 2,580,604 acres. The lands not only are of great value in the protection of watersheds of many of the most important streams available for navigation and incidentally for hydro-electric power development, but are also of material importance in supplying timber and for demonstrating to private owners the methods of managing National Forest lands for the production of timber to make them profitable investments.

Arthur D. Little, New Chairman of Chemical Exposition Committee

Arthur D. Little, president of Arthur D. Little, Inc., of Boston was elected to succeed Charles H. Herty as chairman of the Advisory Committee of the Exposition of Chemical Industries at a meeting of the committee held at the Chemists' Club, New York, on February 24. Dr. Arthur D. Little is one of the most widely-known chemical engineers in the United States and one of the pioneers in the modern American chemical industry. He is president of one of the largest research and engineering organizations in the world, the founding of which dates back to 1886. Dr. Charles H. Herty, who resigned from the chairmanship of the Advisory Committee, owing to the pressure of other duties, is president of the Synthetic Organic Chemical Manufacturers' Association of the United States. He has been chairman of the committee for ten years, serving since the inception of the Chemical Exposition in 1915. He remains a member of the Committee.

Dr. Little has been a member of the Exposition Committee for the past ten years. This, the Tenth Exposition of Chemical Industries, will be held at the Grand Central Palace, New York, September 28 to October 3, 1925.

Salesmen to Hold National Round Table

A national round table for the discussion of business conditions in the entire paper industry will be held at New York, Monday, March 30, the day before the opening of the annual convention of the National Paper Trade Association. Instead of a purely New York division report on conditions, the Salesmen's Association of the Paper Industry will be invited by the New York division to attend a national get-together for a free-for-all discussion of market conditions, and prospects for the balance of the year.

The decision to hold such a national round table was reached at the weekly luncheon of the New York division on Monday of the current week. It was reported that a number of the leading salesmen from all portions of the country will be in the city during the week of the merchants' convention, and it was thought that a round table of more than the ordinary scope would be a happy way of getting the salesmen together.

The Joint Committee on Approved Chemists has recently approved for listing Mr. Wm. F. Goldsmith of the Standard Paper Company, Kalamazoo, Mich.

White Water Purification in Kalamazoo Valley

By W. F. GOLDSMITH
Standard Paper Company, Kalamazoo

LATE IN 1922, the various paper mills in the Kalamazoo Valley were ordered by the state to take steps within ninety days toward purifying mill discharge before emptying into streams. No definite purification standards were laid down which leaves a doubt in the minds of some as to what constitutes pollution, but in the strictest sense, it may be said that any foreign material whatsoever finding its way into the water which lessens the degree of purification of the stream before passing by the mill may be considered pollution. If enforced to the letter, this may work a hardship in some cases, according to the difficulty and cost of recovery and the reusable value of the recovered material, but in most instances, the savings made will more than offset the cost of installing and keeping in condition suitable recovery apparatus, resulting in a boon to the mills themselves. It is the general opinion that so long as the mills conscientiously try to purify their waste, no drastic or unreasonable measures will be forced upon them.

The main objection of the State is that the present effluent, consisting largely of fibre or cellulose, consumes oxygen, made worse in winter by ice formation and so destroys animal life. This oxygen is started to be consumed immediately upon entering the stream and continues until the cellulose is entirely decayed, which may be at some considerable distance from the point of entry. In this connection it might be remarked that the problem here differs from ordinary sanitation methods, in that the latter is concerned mostly with nitrogen and the state in which it is combined, while here the carbon and oxygen combination affords the prime investigation.

Due to the fact that the treatment of paper mill waste has never before been attempted on such a large scale, it was thought advisable to conduct some experiments before making definite disposal plans, and to this end Mr. G. S. Pierson, hydraulic and sanitary engineer of Kalamazoo, was retained by an association of mills to obtain the information. Experimental work was started in June, 1924. The apparatus consists of a sedimentation tank (see accompanying illustration), with adjustable baffles for controlling the flow of white water and having sludge hoppers at the bottom designed to remove the sludge in various degrees of concentration. The tank itself is about 30 feet long by 6 feet wide and 10 feet deep, situated on the banks of the Kalamazoo River and conveniently piped to the outlets of both a book and board mill. Each day that either of these mills have been in operation, a portion of the discharge from one or the other has been passed through the tank at variable rates of flow. The tank was first operated at a fast rate, designedly at a faster rate than would obtain results likely to be acceptable to the State. The rate has been gradually decreased at intervals. In each test, the volume and time for settling has been recorded and also daily chemical analysis made of the ingoing and outgoing fluid in a laboratory specially equipped for this work. At the end of each week an analysis is made of a composite sample representing the weeks run to check daily figures. The latter analyses consistently show a slightly lesser amount of fibre than the daily tests, due to the fact that celluose, even though very inert and not subject to attack by many reagents, is nevertheless soluble in water to a very small extent, a point not generally recognized. In addition to this, tests have been run from time to time on samples of the discharge from all the mills in Kalamazoo and vicinity. These samples when taken hourly over a twenty-four hour period under normal operation are fairly representative of what the mill is doing.

According to State requirements results must be obtained for the following items. Methods used are in accordance with the Standard Methods for the Examination of Water and Sewage, Fifth Edition, American Public Health Association:

Total solids.
Total fixed solids.
Total volatile solids.
Total soluble solids.
Volatile soluble solids.
Fixed soluble solids.
Suspended solids.
Volatile suspended solids.
Fixed suspended solids.
In addition, the following items are also determined:
Oxygen consumed corrected by blank—parts per million,
Blank for above parts per million
Oxygen consumed per million gallons.
Alkalinity to methyl orange as calcium carbonate in P.P.M.
Alkalinity to phenolphthalein as calcium carbonate in P.P.M.
Free chlorine.
Turbidity.
Volume of suspended matter after 24-hour sedimentation in per cent.

From the standpoint of the mill man looking for possible savings, only the total and volatile or ignitible suspended solids are of interest, these figures representing the amount of recoverable material. As might be expected, considerable variation was found from day to day in the effluents, due to variation in product, cleaning up, retention in tanks, lodgment in sewers, etc. The ratio of volatile to total suspended solids is much greater in board mills than in book and fine paper mills, thus simplifying the former's problem.

While practically all of the mills are equipped with savealls of various designs and descriptions, yet results show that every mill is polluting the stream to a greater or lesser degree. This is without doubt due to the fact that so long as the mills were allowed to dispose of their waste by simply discharging into any available stream, they concentrated their attention on that portion of the white water containing the most fibre and in a usable state if recovered, employing in his connection the most economical, but sometimes not the most efficient, means for retaining in the output as large an amount of material as possible. However, conditions are now made much harder, since under the ruling of the State, the mills are forced to retain a large amount of material which in many cases is very difficult to handle and dispose of. Yet these strict conditions should work a benefit ultimately, in that nearly every mill can make some further use of its present waste.

To date all data has been obtained by simple sedimentation without the use of chemicals. While it is not permissible as yet to publish any results, facts so far obtained seem to indicate that the problem may be solved in many cases by simple sedimentation, and in the remaining cases by sedimentation and filtering, with possibly some chemical to aid the settling and prevent decay. The work is being continued and promises to be the most extensive and informative ever attempted in connection with cleaning up paper mill wastes.

Recovery Equipment Now in Use

As mentioned before, nearly all the mills have save-alls, and brief description of some of them may be of interest. At the new mill of the Kalamazoo Vegetable Parchment Company, there is installed a very large settling tank which handles all waste water from their large machine. Wooden scrapers attached to a slowly moving chain carry the settled material along the bottom to various pumps which return the recovered material into the paper making process at various points, according to the consistencies at the different outlets.

The clarified water is used to wash down beaters and at all points on the machine but the showers where fresh water is employed. This saveall is about 98 per cent efficient and wastes only 400 to 500 gallons per minute to the sewer, this representing the fresh water used. At this mill, the Kalamazoo Vegetable Parchment Company is actually putting back into the Kalamazoo River water in a very much purer state than they draw it out from. In the other paper making mill, each of the two machines is equipped with a Bird Save-

Sedimentation tank, situated on the banks of the Kalamazoo River, Michigan

all. These have been found to be very satisfactory, ranging around 70 per cent efficiency and are very easily kept in repair.

The Hawthorne Paper Company have no save-alls at present, but tentative plans call for use of a multi-compartment sedimentation tank in conjunction with chemicals to both aid in settling and prevent fibre decay and hence slime. It is believed that an entirely closed system may be effected in this way.

The Bryant mills recover by pure sedimentation with no aiding chemical. Their seven save-alls average around 80 per cent recovery. The settled material is pumped from the bottom of the tanks and used to wash down beaters and in other process work, as is the clear water.

The Western Board employs a screening device operating intermittently as needed and this seems to operate fairly well as screening methods go.

At present the Standard Paper Company also use a single, motor driven, rotating screen of the outward flow type. Sedimentation is considered as the solution to their problem. The white water system of the Sutherland Paper Company is very well closed up by settling tanks aided in the last stages by Boothal, a neutral coagulent. All recovered stock and water is reused, the latter even to wire showers. Occasional cleaning serves to keep these in good shape.

At the King division of the Allied Mills, there are four sedimentation tanks situated in the basement of the building, one for each machine and handling all water leaving them. Originally they were built similar to the large K.V.P. saveall; i.e., the white water emptied directly into the savealls which were provided with slow moving scrapers to drag the stock and filler to two or more convenient outlets located in the bottom, from where it was pumped into the head box, beaters, etc., according to the consistency of the particular outlet. However, considerable trouble was experienced with foaming, excessive variation in consistencies at the outlets, and also surging in the tanks when the water was withdrawn for beater use. This latter tended to loosen slime deposits on the sides and was a constant source of annoyance. Recently one of these savealls was remodeled and has since proved to obviate the above faults almost entirely. The tank which is approximately 80 feet long by 10 feet wide by 8 feet 6 inches high over all, was divided in the cross section into three compartments, which we may call number one, two and three. Compartments one and three are about 4 feet long each and compartment one is fitted up with a conveyor or scraper exactly similar to the one in the large compartment but moving in a direction at right angles to the flow. The entire white water empties by gravity to a wooden tank, situated close to the main saveall and having an overflow to it. Water for washing down the beater is drawn from the bottom of this tank. The overflow passes to compartment number one which in turn overflows into the large compartment number two and in which a motor driven chain with wooden scrapers attached operates lengthwise of the tank counter current to the flow, dragging the settling along the bottom back to number one compartment, where the scraper before mentioned discharges it to a single pump. This is returned to the beater at a consistency quite uniform to that of the beaters themselves. An average of 2 horsepower is all that is required to operate. The clear water overflows to compartment number three and is reused at all convenient points with the exception of a single wire shower. The remaining three savealls are to be remodeled soon identically the same. It is thought that a shower directed upon the wooden scrapers will keep them clean removing the last objectionable feature.

From the above brief outlines of the recovery equipment already operating, it can be readily observed that the preponderance of opinion is heavily in favor of settling devices.

Matthias Koops—An Early Pioneer in Paper Making Research

By Edgar M. Rutter

A RECENT article in The Paper Industry on the manufacture of straw into pulp and paper reminded me of an old book I had read some time previously, entitled "Historical Account of the Substances Which Have Been Used to Describe Events and to Convey Ideas, from the Earliest Date to the Invention of Paper," written by one Matthias Koops, and published in 1801.

In this book Koops gives a list of the different substances used for recording events and occurrences, from the beginning of history down to the introduction of paper into Europe, and then goes on to discuss many things that might interest modern paper makers, the most interesting of which is that much-alive topic—the shortage of raw materials.

At the time at which he wrote (1798-1801, just about the time when the Fourdrinier was being developed) there was as much concern in England over the scarcity of rags for paper making as there is today over the threatened shortage of standing timber for conversion into woodpulp. Koops was much worried over this condition, and proceeds to describe experiments he had made with many substances in order to find a substitute for rags. He succeeded in making paper out of rye straw, old papers and woodpulp, as he tells us in the following extract from his book:

"I have had the satisfaction to witness the establishment of an extensive paper manufactory, since the first of May, 1880, at the Neckinger mill, Bermondsey, where my invention of remanufacturing paper is carried on with great success, and where there are already more than seven hundred reams weekly manufactured, of perfectly clean and white paper, made without any addition of rags, from old waste, written and printed paper.

"The paper whereupon this is printed is an undeniable proof [meaning part of his book]. It is, however, only of an inferior quality, being made from the straw in the state it comes from the farmyard, without assorting the weeds, and those parts of the straw which have been coloured by the weather . . . By several trials which I have made to change the yellow colour into cream colour, and white, it seems to be unquestionably practicable, which will extend its consumption, and remove the prejudices which are generally cherished against new discoveries."

Again, in discussing the manufacture of woodpulp into paper, of which material the last section of the book is printed, he makes the following observations:

"Converting wood, straw, and other vegetable substances into paper may therefore be rendered useful for a variety of purposes; and the substance of the wood paper on which these lines are printed exhibits an indisputable proof that useful paper may be manufactured from the hardest part of wood alone, destitute of its pith or bark; and if any of the suggestions here stated, as to the application of the manufactured material should be thought reasonable, experiments of some

able manufacturers will prove that this paper can be again converted into a substance more hard and durable than any wood of natural growth."

After numerous efforts Koops secured from Parliament the sole right to manufacture paper from these substances, the use of which he fully expected would revolutionize the industry in Great Britain, and make the country independent of Continental Europe for its supply of rags.

He was ahead of his time, however, and his efforts came to naught, so that rags continued to be the only supply of paper makers until Keller invented the mechanical wood process, in 1840.

Appraisals and Their Application*

By L. H. OLSON, Vice-President American Appraisal Co.

I HAVE been invited here to talk to you on the subject of appraisals and their application, and requested to go into some detail as to the actual investigation and operations involved in the preparation of appraisal reports as well as the application of these reports to the plant and cost accounting insurance and taxation problems in which you men are interested.

It may, therefore, be desirable to take up in some detail the actual work involved in the preparation of an appraisal of a typical paper mill, or other similar property.

A Typical Paper Mill

A typical paper mill includes such properties as standing timber, water rights, land sites for plant and residence purposes, plant buildings, machinery, fixtures and tools, office furniture and fixtures, delivery equipment, railroad sidings, logging railroad, rolling stock and logging equipment.

In considering such a property from the appraisal point of view, we would break down into about forty classifications of property and investigate and inventory each classification of property as an independent unit.

For a standard appraisal of a paper mill property involving valuations of $1,000,000 more or less, a staff of six or more appraisers might be assigned. This would depend somewhat upon the time within which the appraisal report has to be completed.

The preliminary investigation would be in reference to the character and location of the property, and any special form or classification of the appraisal report that might be required to meet the plant accounts, departmental divisions, insurable classifications, or taxation requirements.

One of the first questions would be the method of numbering and designating the respective buildings. If there was existing a system of numbering and designations that should be conformed to, these would be as followed, if not, a system of numbering and designation would be worked out in conference with the plant executives. Usually such a numbering system would follow the manufacturing processes beginning with the office or administration building, buildings used for prepared wood, ground wood, digester, acids, beater, bleaching, machine, and finishing divisions and ending with warehouses and outside construction and equipment.

Frequently, what may be considered one building by the plant manangement is by the appraiser considered as several buildings on account of the differing character of the construction. For insurance purposes, also, several subdivisions may be necessary to conform to the fire cut-offs.

Where there are several operations carried on in one building, kept separate for purposes of cost finding, it is necessary to determine the boundary of these divisions to guide the appraiser in listing the equipment for such department.

A plat plan is usually prepared showing the boundaries of the property, the locations and dimensions of the respective buildings and the important items of outside or yard construction, and the boundaries of the departmental divisions within the respective buildings.

Copies of this plat plan with other instructions in reference to a particular appraisal are furnished to the respective appraisers, and guide them in their designations of the location of the properties by buildings, floors, departments and outside.

The actual work of inspecting and inventorying the properties will be assigned to different appraisers specializing on different kinds of properties. One appraiser will take the timber, another the water power rights, another land, another buildings, another machinery, transmissions, piping, and minor equipment.

The Valuation of Timber

The valuation of the timber is usually based upon the report of a cruiser who estimates the quantity and character of the standing timber and reports on the character of the land in relation to efficient timbering and logging operations. The value is usually based upon a unit price per thousand log measures of standing timber, in accordance with the character of the timber, the existing accessibility of the timber, and its relation to the market.

The land appraiser obtains the description and boundaries of the land from the deeds, or other authentic information, inspects the land as to its location, utility, shipping facilities and environment. He usually looks up the assessment records, investigates sales of joining or similar land, obtains the asking price for any similar land then on the market, and compares this evidence with his prior information and judgment in determining the market value of the particular land under consideration.

The description of the land is then written, giving its location, boundaries, area and any special conditions affecting its value with the unit price per square foot, or other unit of measurements, and the resultant total value.

Plant sites in a remote community may simply represent the cost of acquiring unimproved land at a few dollars an acre plus the cost of preparing, grading, etc., to make it adaptable for a plant site. If the site is selected with a consideration for unusual water, transportation or other facilities, it is entitled to some additional value on these accounts.

Plant sites, however, generally range from something like one cent a square foot in small communities up to one dollar a square foot and more in larger cities.

Appraisal of Buildings

The appraisal of the buildings is usually assigned to two specialists. One takes the building construction, and another the building fixtures, such as heating, lighting, sprinkler system, etc.

The building construction appraiser measures the size of the buildings, the height of the stories and prepares sketches showing the general arrangement and construction of the buildings with the thickness of walls, kind of timber, and description of floors, windows, partitions, stairs, painting, roofing, skylights, drainage, etc. From these sketches, descriptions and other notes, which he takes during his inspection of the buildings, he prepares a schedule of quantities and descriptions of the different materials entering into the construction of the building, beginning with the yardage of excavation, cubic foot of foundation work, thousands of brick in walls, number and sizes of the different kinds of timber, the feet and board measure of lumber going into floor and roof linings and finished floors, number and description of the doors, windows, stairways, partitions, etc., square yards of painting, squares of roofing, lineal feet of gutters, conductors, etc.

To promote accuracy and to economize the time of the field appraiser, he lists the area and depth of foundation, the length, height and thickness of the walls, dimensions of the floors, roofs, etc., without taking time to reduce these to the unit quantities of excavation, brick, steel, lumber, etc. These computations are made later by the office staff after this (bill) of quantities, as prepared by the field appraiser has been checked as to accuracy against the descriptions and sketches of the buildings.

The field appraiser investigates the local conditions as to wages and efficiency of labor, and source of supply and market prices for building materials in that locality and delivered to that site. The cost for freight charges, truck delivery and unloading are taken into consideration in determining the unit prices to be used as the basis for the determination for the cost and values. This current information is checked against the accumulated price data and the other information collected by the appraisal organization.

The condition of the buildings and the depreciation to be

*Delivered at the convention of the Cost Association of the Paper Industry, New York, December 10-12, 1924.

applied against the current reproduction cost in the determination of the present sound values of the buildings is an important factor, and the appraiser observes carefully the condition of the buildings to see if any settlement has taken place due to faulty foundations, poor construction, or overloading, decomposition of mortar or brick due to the exposure to the weather or from (steam) or acids used in the manufacturing processes, wearing of the finished floor or roofing, rock in any of the timber construction, and lining, and deterioration from these and other causes in doors, windows, partitions, drainage, etc.

In accordance with these observed conditions and known age of the buildings, he marks the percentage of exhausted life, or depreciation for these respective portions of the buildings.

The total depreciation applicable to the building is later determined by weighing the average depreciation in proportion to the reproduction cost and per cent of depreciation for the respective parts of the building.

Building Fixtures

The other appraiser inspects and inventories the heating, lighting, sprinkler system, etc., in regular sequence. He usually starts at the point where the wiring or piping enters the building, follows this through the lower story, measuring and listing the lineal feet of wiring and piping, and noting and itemizing the connections, and lists individually the heating and lighting fixtures or sprinkler heads. These are listed separately for each story of the building, to facilitate the identification and checking of these at any time in the future.

The condition of these must also be observed, and the exhausted life recorded in percentages of depreciation sustained.

One appraiser usually lists the machinery, starting in with the boilers, engines, pumps, generator and the productive machinery in the respective buildings in the order in which the buildings have been numbered. Each machine must be described with its correct technical description and size, with notation of any extra attachment or equipment that may come as an extra to the basic cost of the machine.

Description of Machinery

In the description of the machines, as in all other portions of the appraisal work, it is very important that the descriptions be correct as to designation, size and extras as upon this depends the correct pricing of the machines. An error in the designation of the manufacturer's name, type, size and extras may result in an important error in pricing the machines. Even if a correct price is placed on the machine and there is an error in the description of the machine, this may later result in a question as to the accuracy in the price, and the discrepancy between the description and the price may serve to discredit the value of the machine or even of the entire appraisal.

In addition to the cost of the bare machine with its attachments, an allowance must be included for freight and delivery charges, unloading, and installing the machine. The installation costs may include foundation and millwright construction supporting the machine.

A careful observation must be made of each machine as to its condition and the amount of deterioration it has sustained through age and service. Other factors that must be considered are its utility in the particular plant and its degree of obsolescence in comparison with modern machinery of a similar kind.

General Equipment

Similar methods are pursued in the inspection and listing of the power feed wiring (shafting), pulleys, beltings, manufacturing piping, trucks, scales, tools and minor equipment throughout the plant. Each of the dozen or so classifications comprising this class of property are listed separately, taking each classification floor by floor of each building.

It is this standardizing of classification and systematic method of listing each classification by each floor, building and other location that insures the inclusion of all of the properties comprising the plant equipment.

The office furniture and fixtures comprising desks, tables, chairs, typewriters, computing machines, filing cabinets, carpet, rugs and miscellaneous equipment; delivery equipment comprising trucks, automobiles, horses and stable equipment, and various items comprising the logging equipment are inspected and listed in a similar painstaking manner.

Accuracy of Inspection

No one not having actually engaged in the work of inspecting and listing properties for appraisal purposes has any conception of the amount of experience and training required to properly inspect, list and describe all of the materials, machinery and fixtures entering into the construction and equipment of a paper mill. Every detail has its influence upon the price of the materials and the cost of fabrication and installation. Consider the kinds and grades of lumber that enter into timber framing, finished floors, factory fixtures, partitions and office furniture. These usually comprise short leaf yellow pine, long leaf yellow pine, spruce, white pine, maple, oak, birch, walnut and mahogany in various grades. An error in designation of any item of lumber in building, fixture or furniture makes a difference in the price.

Excavations, concrete, brick, steel, roofing, painting, etc., all have their individual specifications and descriptions.

Power feed wiring, transmission and piping, each have their kind and sizes with a variety of fitting of different sizes, kinds and makes requiring identification and listing.

Selection of men for accuracy of observation and listing.

Trained appraisers will, however, list this great diversity of construction and equipment in a systematic, classified record in a remarkably short period of time. It may, however, take six men ten days or more to properly inspect and list all of the property in a paper mill with a value of one million dollars more or less.

The field appraiser assembles this inventory by classifications of properties subdivided in accordance with the respective buildings, floors and departments, indexes these, prepares his supplementary report covering all local conditions bearing upon the cost and values of the property, and sends all of this data to the office of the appraisal organization.

When this field inventory is completed, the appraisal reports are less than half completed as far as the total time involved in the completing of the appraisal report is concerned.

A Valuation Laboratory

The office of an appraisal organization may be designated as a valuation laboratory. Here are the classified, tabulated results of many years of investigation, analysis and recording and extensive libraries and reference files of catalogues, price data and individual quotations. Here are received daily technical magazines with market conditions and price quotations, price lists and discount sheets from associations and dealers, specific quotations on individual items of machinery and materials, labor quotations, freight rates, etc.

Here are cost analysis departments, analyzing and testing costs in accordance with the relative amount of materials, labor and overhead going into construction and installation; organized departments for checking the inventories of the field appraisers as to accuracy of quantities, sizes and descriptions, and the application of unit prices to the inventory items; clerks specialized in the computation of quantities, extensions and footings for the different classes of the property inventory.

After the notes of the field appraisers have stood the test of the checkers as to quantities and descriptions, they go to the pricing department where the prices applied in the field are checked and the additional prices applied from the office records or for special quotations that may be necessary to obtain for the specific property.

Following the pricing the extensions and footings are made and checked when the complete record goes to the Typing Department. Even in the Typing Department, the typists specialize on different classes of work, to promote efficiency and accuracy. The typed inventories are checked both by proofreading and by a recomputation of all of the figures appearing in the typed statement.

The complete typed inventory with all of the field notes then goes to the Summarizing Department where the total appraised reproduction cost and values are classified and arranged in accordance with the appraisal classifications, building designations, departmental divisions, plant accounts,

and insurable divisions, in accordance with which the final appraisal report must be classified and arranged.

The final result is usually boiled down into a certified statement specifying the general character of the properties appraised, and stating the basis upon which the values are determined and the total values for the main divisions of property assets.

Complete Appraisal Report

The complete appraisal reports are then ready for assembling and binding. In a large appraisal organization such as the one I represent, we make our own covers and bind the reports.

The complete appraisal report then consists of:

(A) A certificate of values usually in a one-page certified statement.

(B) A summary volume with numerous summaries in accordance with property classifications, building locations, departmental divisions, and plant accounts.

(C) An insurance summary showing the distribution of the appraised values in accordance with the insurable divisions and with a separate schedule of foundations, piping, etc., below ground and other property considered non-insurable.

(D) Inventory volume containing the detailed schedule of properties with the unit costs. These are usually arranged by appraisal classifications with the items listed in accordance with their building floor department location.

(E) The appraisal reports are usually accompanied by certain drawings. These may consist of anything from a plat plan showing the boundaries of the properties with the size, location and arrangement of the respective buildings up to complete set of detailed drawings with sections showing the construction of the building and floor plan, showing their arrangement of all building features and the location of machinery transmission and major items of equipment.

The appraisal reports comprise a statement of total values, complete summaries and detailed inventories that permit of the analysis of the property costs and values from the total figures appearing in the certificate and summaries down through the respective accounts and classifications to the individual property units.

The orderly classification and arrangement permit of finding the total cost or value for any subdivision, and the indexing in the inventory volume permits of the ready location and identification of any property units with its description, type, size and appraised cost.

The drawings serve as an addition means of identification, the location of the item in the plant and for corroboration of the inventory.

The appraisal reports are now ready for use by the plant management. Plant properties, however, are subject to continuous change on account of additions, removals, reconstruction, changes in equipment, and wear and tear, and the appraised cost and values are subject to change with the rise and fall of market prices and the result of depreciation.

Continuous Appraisal

A continuous appraisal service is necessary to keep the appraisal report, cost and values up to date in accordance with these changing conditions.

In order to keep these appraisal reports up to date in the most economical manner, the appraisal company co-operates with the plant management in the maintenance of a record covering all plant expenditures and changes. The appraisers may furnish standard forms upon which these expenditures and changes may be recorded or may study the plant accounting records and organization and make recommendations for special forms and methods to facilitate the accumulation of this information in a form and manner that will best serve the plant accounting requirements and, at the same time, meet the requirements of the appraisal organization for keeping the appraisal report up to date.

Where plant requisition forms are used for additions and changes to plant properties, these automatically accumulate the necessary information as to the location and description of properties added, adjusted or changed, and the material, labor and cost involved in such changes.

An additional copy of these plant orders or requisition forms or a summary from these or the other plant accounting records may be maintained on two plant report sheets furnished by the appraisal organization as the basis for keeping the appraisal records up to date. One copy of these sheets is furnished to the appraisal organization and one copy retained by the plant management for their records. In order to have these records up to date it is recommended that these reports be furnished to the appraisal organization monthly, covering the expenditures on and the changes in the property during the prior month.

Reports Checked and Audited

As these reports are received by the appraisal organization they are checked and audited to see that the classifications, and descriptions conform with appraisal requirements, that the proper location and property classification are furnished, and that the costs of material, labor and installation are reasonable.

The costs are then checked or analyzed as to their proper distribution as between additions, renewals, and maintenance expenditures and summarized in accordance with the property location and classifications.

These reports are then checked against the original appraisal report and the additions and changes noted therein.

Improper Classification Disclosed

This analysis and checking usually brings to light any failure on the part of the plant management to properly classify and locate the items, failure to include all charges for foundations, freight, installation or necessary auxilliary equipment, or to report the removal of property replaced by the new equipment, as is particularly the case in connection with alterations when property in the original appraisal has been removed or reconstructed in connection with betterments and changes that have been made.

The appraisal organization then reports back to the plant management any comments and suggestions that it may have in reference to the reports received, with summaries showing the distribution of the costs of the additions and removals and the revised appraised costs and values, giving effect in these reports to the estimated depreciation for the period.

Periodically or as required these costs and values are revised in accordance with the changed market conditions.

With this up to date property record maintained through the Continuous Appraisal Service, the appraisal organization is in a position any time to most efficiently check and verify the report by assigning appraisers to reinspect the properties and verify and correct where necessary the reports which have been submitted and previously analyzed, recorded and summarized by the appraisal organization.

This personnel service is desirable where any extensive classifications have been made that makes it impossible or impractical for the plant organization to properly identify, record and allocate their cost report.

In case of loss of all or a portion of the properties by fire, it permits of a rapid and accurate presentation of a proof of loss.

The revision of the appraisal values whenever market conditions change and the revision of the insurable value is required permits of the changing of the amount of insurance carried to avoid over-insurance and co-insurance.

Verification of Value Required

There are many emergencies that require the verification of the value of the plant property. When the emergency arises, whether it is as the result of fire loss, re-organization, financing or sale of property, the plant management who have up to date appraisal records that can be certified to with the minimum amount of time and effort is in a most advantageous position.

We have just had a call from bankers for a report on the value of extensive plant properties within what would have ordinarily been an impossible time. The property proved to be one upon which we had up to date appraisal records main-

tained through our Continuous Service and it was possible to reinspect the property, certify and correct the report and furnish the bankers an authoritative statement within a time that surprised and delighted them. It also reflected credit on the plant management who had maintained property records in such a manner that these were up to date in a manner that verified our totals.

Chemical Stains for Use in Microscopical Analysis of Paper*

BY H. N. LEE

Wood Technologist, Hammermill Paper Co.

AT THE present time there are available a number of stains or dyes which may be used very successfully in the analysis of paper. Without doubt the Herzberg stain gives as good a differentiation as can be desired for rag-sulphite mixtures and for sulphite-groundwood mixtures. Likewise the Lofton-Merritt stain for unbleached sulphite-sulphate mixtures, the Bright stain for unbleached-bleached pulp mixtures, and the Alexander stain for soda-sulphite mixtures, may be used. To these latter stains, which involve the use of aniline dyes, may be added the Sutermeister stain, a strictly chemical stain which differentiates various fibers in much the same way as the stains which are described but has the disadvantage of requiring application of two successive solutions. The following stains are submitted as being equal or superior to the foregoing so far as bleached fibers are concerned and of greater ease in application.

Formulas as Examples

In making up stains all original solutions are saturated at room temperature except the iodine-potassium iodide mixture which is made up of 5 grams of iodine in 10 grams of potassium iodide in 10 cc. distilled water. Table 1 gives formulas which may be taken as examples, for considerable variation can be made in any formula within which differentiation of fibers occurs although the degree of differentiation varies.

TABLE 1

Parts of

Formula No.	$MgCl_2$	$CaCl_2$	$ZnCl_2$	$BaCl_2$	I in KI	KI	H_2O
32	..	50	..	2	1	..	..
35	..	50	..	..	1	..	to 8
37	..	..	..	30	1	..	..
*42	..	..	10	..	(see note)	4	1
119	39	9	13	..	1	..	..
120	39	13	13	..	1	..	..
121	40	20	20	..	1	..	..
122	33	33	33	..	1	..	..
123	27	27	27	..	1	..	..

* Two drops I-KI in each cc. of potassium iodide. (KI)

Made up in a different manner are Formula 50,—20 g. $ZnCl_2$ in 10 cc. H_2O, 6 g. $CaCl_2$ in 10 cc. H_2O, 1.2 g. KI and 0.1 g. I in 3 cc. H_2O, and Formula 53—5 cc. Herzberg stain (either new or old), 5 cc. saturated solution $CaCl_2$, to which it may be desirable to add 1 drop I-KI solution and perhaps a few drops of water.

It may be seen from Formulas 119 to 123 that a wide variation may be made in the stains and still secure a good differentiation.

Using the Stains

In using the stains, they should be added to the disintegrated paper or pulp after water has been blotted off with hard filter paper. The drier the fibers are, the darker the resulting colors will be. The exact colors obtained are difficult to describe. Roughly speaking, the following are the general results:—

Rag—Brownish red.
Bleached sulphite—Violet or lavender.
Unbleached sulphite—Violet to greenish brown.
Soda—Deep blue.
Sulphate—Greenish brown to grayish blue.
Groundwood—Lemon to golden yellow.

*Presented at the annual convention of the Technical Association of the Pulp and Paper Industry at the Waldorf-Astoria, New York City, February 3 to 5, 1925.

Depth of Color

The depth of color is about the same in each kind of fiber. Bleached sulphite shows the weakest color, and, if stains are not properly made or if too much water is present, this may be nearly colorless. The colors vary with variations in the proportions used in making up the stains. In general more zinc chloride increases blue shades, more magnesium or calcium chloride increases the red shades, while more iodine makes all colors darker and sometimes bluer. Variation in the iodine content causes more difference in the shades than changes in the other chemicals. Addition of water or of potassium iodide solution tends to make the colors less strong, but in general, if colors are too dark due to too great a proportion of iodine, it seems to be better to add one of the chloride solutions rather than water. The changes in shades resulting from varying the constituents of the stains may be utilized in adjusting the stains in case unsatisfactory results are obtained.

In making up the stains it has been found advisable to hold back some of the iodine solution and add the latter portion only drop by drop. Possibly variation in chloride solutions due to changes in temperature makes this necessary. Stains should be kept in colored glass bottles or in the dark. If the iodine has bleached out, cautious addition of the iodine solution will renew the efficacy of the stain.

These stains may be safely used to determine percentages of rag, bleached sulphite, soda, groundwood, and to establish the presence of sulphate and of unbleached sulphite. For percentage determination of these latter fibers the Lofton-Merritt and the Bright stains should be used.

The writer is making further studies of these combinations with the hopes of developing better formulas, especially for use with unbleached fibers.

Summary

1. Formulas are given using magnesium, calcium, zinc or barium chlorides with iodine and potassium iodide, for identification of paper-making fibers.

2. Proportions used in making up the stanis may be varied considerably.

3. Stains may be adjusted by adding certain constituents. Old or bleached stain may be restored by adding iodine.

Standard Method for Testing Rags*

By Materials Testing Committee—H. V. Kiely, Chairman

Moisture

SAMPLING—Ten per cent of the bales shall be sampled on shipments of one car or more, twenty per cent on less than car lots. Two samples of approximately one-half pound each are taken from each bale, one from the center and one 10 inches from the wrapper and placed in sealed containers.

Procedure—The entire sample obtained as stated shall be dried to constant weight at 212° to 220° F. Twelve hours will usually be sufficient. Moisture should be below 3 per cent. Results as high as 6 per cent are not uncommon, however, and may possibly indicate intentional wetting.

Oils, Fats and Grease

A 200 gram, bonedry sample is boiled under a reflux condenser for four or five hours, then washed with 100 cc. additional solvent. The combined extraction and washing carbon tetrachloride is distilled in a weighed flask, which is dried to constant weight at 212° to 220° F. and weighed. This figure may be used to good advantage as a control on alkali concentrations for cooking oily rags, as well as to detect undesirable paraffine sizing in such rags as suit linings.

Shrinkage

Mill Test—All the washers from the bleach of rags to be tested are dropped to a drainer which has been carefully examined to insure uniform draining with no loss of fiber. Each car of half stuff is weighed and sampled from top, middle and bottom for moisture test. From the dry weight of half stuff and the weight of dressed rags charged to the rotary,

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the shrinkage is calculated. Regular mill procedure is used in determining alkali concentration, pressure and time of cook.

Laboratory Tests—A bone dry sample of from 5 to 10 pounds (either that used for moisture test or one taken at uniform intervals from the rag cutter in the mill) is cooked in a gas fired rotary boiler, using mill procedure for time, pressure and alkali concentration. If this is not available, 8 per cent lime, 2 per cent soda ash, 35 pounds pressure for 10 hours may be used, cutting the soda ash to 1 per cent on new, light colored rags. The rags are then washed for 4 hours to insure complete removal of alkali and filler in a miniature washing and beating engine, drawing them out to approximately the same condition of fiber used in mill practice. Two per cent bleach and 1 per cent alum are added. After 2 hours, the half stuff is dropped to a cloth lined perforated box and allowed to drain over night. As much moisture is pressed out as possible; the stock is dried at 212° to 220° F. for 24 hours, weighed and shrinkage calculated.

This method has been found to check the mill test within 5 per cent and is particularly valuable in figuring cost estimates on new lots of rags.

Approximate Laboratory Method—A dry 1 pound sample is cooked with 2 per cent NaOH for five hours in an autoclave at 300° F.* The stock is washed for 6 or 8 hours with running water, allowed to stand 2 hours with 2 per cent bleach and 1 per cent alum, washed 2 hours, dried and weighed. The shrinkage figure by this method will be considerably lower than that obtained on the mill test (at times only one-half). Another test should be run at the same time on rags of similar grade that have been tested by the mill or laboratory method. This method has been found to be of considerable value in determining excess filler in rags such as buckrams, when only a small sample is available.

Color After Bleaching—The color of the half stuff obtained from the shrinkage test by the laboratory method is determined by comparison with mill half stuff of rags of the same grade and price, or by comparison with standard color discs used in pulp testing. The presence of any raw or unbleached fiber should be noted.

The stock obtained from the approximate laboratory method will give some measure of the ease with which the rags will bleach in mill practice.

*NaOH is used instead of lime and soda ash to facilitate washing when the fibres cannot be drawn out to half stuff in a beater. Boiling in an open beaker has been found to give practically the same results as the autoclave cook.

Notes on China Clay*

BY DONALD V. LOWE

AN ARTICLE by Jas. Strachan, read before the Aberdeen division of the Paper Makers' Association of Great Britain and Ireland about two years ago, pointed out the economic advisability of setting definite standards for moisture and grit in china clay. Mr. Strachan was perhaps considering the subject more from the angle of paper making than paper coating, but his remarks suggest the advisability of giving careful study to the question of standards for coating clays.

Clay is one of our basic raw materials. For a fair-sized plant, a consumption of 5,000 tons per year is not unusual. At an average delivered price of $20 per ton this makes an item of $100,000 per year. It will therefore require only a nominal saving, in per cent, by the average laboratory to more than cover the expense involved.

If we search in the literature for an account of the origin and definition of clay we discover that it is considered "the result of feldspathic decay." Feldspar is a term covering the combinations in nature of silica, potassium, aluminum, sodium and, in lesser degree, calcium, which combinations are widely distributed, rock forming minerals.

When the feldspar decomposes, the final result may obviously vary according to the original composition, the natural agents which were effective in producing decay, the degree to which decomposition has taken place, and other factors, so that we may have almost infinite possible variations in the character of the final clay. Furthermore, whether the clay is primary or secondary, i. e., whether it exists in the original bed where decomposition took place or whether it has been transported to a new bed by water will have a considerable influence on the method of preparation necessary before bringing it to market, and may introduce characteristics which it would be well for us to discover.

The question which the practical paper coater asks regarding clay is, however, "What must I know about clay to determine its most economical use?" and it is to answer this question that the determination of standards among clays is desirable.

Properties Which Determine Value

Now the properties of clay which determine its value to the paper coater are:

1. Color. For certain work exceeding whiteness is demanded, while for other work a much less white clay may answer just as well and be much cheaper.
2. Moisture. This item has commercial importance, as a large factor in the cost of clay is freight.
3. Grit. Too high percentage of grit, which generally is off color and has no covering power, may prove very destructive to machinery, particularly strainer wires, trimmer knives, etc., as well as cause an inferior finished surface. As Strachan points out, 1 per cent of sand means a direct loss of $1,000 per year (on the basis of our assumed mill,) as well as many other less visable losses.
4. Covering Power. This is one characteristic which is of particular interest to the coater.
5. Suspension. In the coating mill this is apparently closely allied to a covering power.
6. Glazing or Finishing Character.

These six properties will be considered in the order given, and methods of determination suggested.

Color

This is capable of numerical expression by means of a Pfund Colorimeter, as outlined on page 353 of Bureau of Standards, Paper No. 262, Vol. 18. It is probable, however, that the average plant will be satisfied by a simple comparison with an accepted standard, made as follows:—

Block of wood about 2x4x6 inches, through the middle of the upper flat side of which is cut a lengthwise groove ½ inch deep by ¾ of an inch wide, is prepared. Across the top of the block, and penetrating to ⅛ of an inch below the bottom of the groove, are made thin sawcuts, into which strips of sheet copper are fitted. These strips are just wide enough to come flush with the top of the block, and are about ¾ of an inch apart. By placing in adjoining squares a standard sample and the clay being examined, and pressing uniformly with a spatula, any marked difference in color is visible. Sample to be tested in this way should be dried to a constant weight at 105 degrees Cent. before testing.

Moisture

In the preparation of clay for coating, the original clay substance is mixed with large volumes of water, both for purposes of transportation and for the settling out of grit and impurities. After the completion of this process, as much as possible of this water is drained and the balance dried out by means of artificial heat. Obviously, this moisture, which we will call mechanical water, may vary considerably, even in the same batch of clay.

Besides the water mentioned above, clay carries varying amounts of water chemically combined, or absorbed by the colloidal matter, the amount of this water depending, in all probability, on the character of the original feldspar and the method and degree of its decomposition. As it probably remains with the clay after coating and drying, it is a question apparently of whether or not it affects the covering power as to its importance. It can be determined by heating to a high temperature, or igniting.

Strachan states that an arbitrary figure of 12 per cent has been adopted in England as a standard for moisture content, but that he thinks it could be reduced 1 or 2 per cent with safety. Variations between different clays of from 6.6 per

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cent to 14.7 per cent have been found, the money significance of which needs no emphasis.

The usual method of drying to constant weight at a temperature not exceeding 105 degrees Cent. gives the necessary information regarding mechanical moisture.

Grit is commonly determined by means of sieving, either wet or dry, and recording the weight left on a screen of certain mesh as percentage grit. This method has the advantage of simplicity, and that is about all that can be said of it.

Strachan develops a method, based upon Stoke's law for the flotation of fine particles, which is very simple and gives as a result, the percentage of grit present as sand, mica, feldspar, etc. It seems that this method offers a good chance of arriving at the true figures for grit. He suggests, as allowable standards,

For coating papers, ...0.1 per cent
For fine papers, ...0.25 per cent
For news, etc., not over .....0.5 per cent

It should be remarked in passing, that Strachan has not mentioned two factors which might possibly affect his results; first, the water used should be free of any "flocculator." In other words, it should be "soft," distilled water preferably.

The presence of any such flocculator might cause some of the clay to be retained along with the grit, giving too high a result, and second, the possible solvent action of the water on the finer particles of grit, especially if alkalies are present or an excess of water is used. This might cause breaking down of the finer crystalline particles, and show too low a result.

At present we are without definite knowledge of the amount of grit which might be permitted in clays for different purposes. It is apparent, however, that, other things being equal, the best clay for our purpose will be the lowest in grit.

Covering Power, Suspension and Glaze

In Technical Paper No. 23, published by the Bureau of Standards in 1911, which is essentially a study of ceramic clays, the theory is developed that plasticity is definitely related to the amount and character of the colloid content, and methods for estimating this colloid content are outlined. It seems altogether probable that an analogy can be drawn between ceramic and coating clays, so that a study of the amount and nature of the colloids in our clays may enable us to predict with reasonable accuracy the comparative value of a clay as to its covering power, ability to stay in suspension and glazing property. (Suggest this study by Bureau of Standards.) Such a study should be undertaken by a well equipped and organized research laboratory to be of value.

Meanwhile, for practical purposes, a fair comparison of covering power may be obtained by a method similar to that used with linseed oil paints, using a standard solution of casein as vehicle. For this purpose fairly stiff cardboard with a pattern printed on it in light type and marked off into squares of 10 inches is used. Enough coating must be applied to cover the entire square, just heavy enough to obliterate the pattern. The weight of clay mixture required is determined directly.

Suspension

This is immediately important to the paper coater, as a clay which settles quickly means difficulty in maintaining uniformity of sizing and color, as well as direct loss on account of clay washed down the sewer from the bottoms of tanks, etc. The usual test is to shake with water in a graduated cylinder, alongside of a standard sample, and measure the height of the sediment after stated periods of time. This method is in general satisfactory. Certain precautions, however, should be taken. For example, the addition to the water of a certain amount of the casein solution which will later be used, and the use of regular mill water, will result in parallel interaction, if any, between the bases and the colloids present.

Glaze

Glaze, or the ability of the clay to take a finish, is capable of being expressed numerically by means of an Ingersoll glarimeter, an instrument designed to measure the amount of light reflected from the surface being considered. It is not known, however, that a definite method has ever been worked out for this particular question, as a very good general idea of glaze can be gotten at the time of comparing color, if the finish that can be given to the clay when pressed into the block is noted.

In all of the tests suggested it is assumed that sampling is carried out with the utmost care, as in a material of this kind results can only be taken seriously if obtained on fair samples. A fair sample from a single 25 ton carload of clay, in bulk, would be the result of no less than seven samples taken at irregular depths and at intervals of 5 feet through the length of the car, properly quartered and reduced to laboratory size.

Color

If a clay is suspected of artificial coloring, and it is desired to discover any such color as may not be fast to light, it should be mixed to a thin paste, a small amount of ammonia added and gradually heated to drive off the excess. Artificial color, except indanthrene, which is fast to light, will come to the surface, (G. K. Spence, American Dyestuff Reporter 12 890-1 [1923].)

Economy of Lime Reburning*

By G. K. SPENCE

Chief Chemist, New York and Pennsylvania Co.

SINCE it is the unanimous conclusion of all pulp manufacturers, who have given the question any study, that the most feasible method of reclaiming lime sludge from the alkali room is to reburn and use it over again in the system, the writer has considered this phase only.

Lime reburning has been considered by pulp manufacturers from time to time for a number of years, but it has not been worked out successfully until in the past six years.

Hammond Lime Reclaimer Introduced in 1890

As early as 1890 the Hammond Lime Reclaimer was introduced. This consisted of two inclined rotaries, each 40 feet long and 4½ feet in diameter. The lime sludge was fed to the upper rotary by means of a screw and this rotary was heated by the hot gases from the lower rotary, which hot gases also surrounded the jacketed screw before passing up the stack. The dry lime from the upper rotary dropped into the lower one through which it passed in the opposite direction and the burned lime was discharged at the firebox end. This lime was conveyed to the alkali room and used to causticize more soda. The capacity of this outfit was only about 5 or 6 tons of recovered lime per day.

About 1908 two different engineers were advocating propositions for reburning lime, and while they differed somewhat in minor details the ideas were essentially the same. It was recommended to use a rotary 100 feet long and 7 feet in diameter which was heated by means of producer gas. The sludge was taken directly from the alkali pans to the rotary, without first going to a filter press to remove the excess moisture. Even when lime cost a little less than $4 per ton at the mill, the figures given by the advocates of the process showed a profit of $1.80 per ton of lime burned. These figures were based on an installation cost of $30,000, including building, a coal cost of $1.60 per ton, a gas producer efficiency of 86 per cent, and a burning efficiency of 2.5 tons of lime per ton of coal. When presented with these figures some mills attempted lime reburning, but it was later considered unprofitable and discontinued. The reason for this failure to produce profitable results was due to the fact that the gas producers were considerably under 86 per cent efficient, the total installation cost was considerably over $30,000, and due to handling very wet sludge the burning efficiency was nearer 1.5 tons of lime per ton of coal. At this time lime was delivered at the mill for $3.91 per ton, and when everything was considered it was found that the reburning cost was considerably more than this amount.

Taken Up Again in 1918

It was not until 1918 that lime reburning was again taken up and it has made rapid progress during the past six years. At the present time lime reburning is being carried on very successfully by a number of soda and sulphate pulp mills.

*Presented at the annual convention of the Technical Association of the Pulp and Paper Industry at the Waldorf-Astoria, New York City, February 3 to 5, 1925.

The method employed, while the details differ some at different plants, is essentially the same wherever it has been introduced.

The lime sludge in the alkali pans is given three washes by decantation and discharged through a perforated plate into the agitated supply tank for the filter. This supply tank should be sumped if necessary, in order to receive the sludge dumps by gravity. The object of the perforated plate is to remove any stones from the sludge and prevent them from passing to the pump supplying the filter. It is not advisable to wash the sludge less than three times by decantation, due to the fact that if the soda is not well removed, it will have a tendency to fuse with the silica in the lime or brick lining and form rings in the rotary. Some manufacturers, who have ample capacity, make as many as four washes by decantation, to avoid this trouble.

The sludge is pumped to the continuous filter where the moisture content is reduced to about 40 per cent. The washings from the filter are either used to wash the stack gases, or returned to the alkali room to be used as makeup or sludge washes. The continuous filter is located directly behind the rotary and the sludge cake is fed, by means of a screw, through a water jacketed chute.

Continous Filter Should Be Used

Owing to the fact that the rotary should have a continuous feed it is essential that a continuous filter be used, as when this equipment is properly installed it requires very little attention. The filter is generally covered with 14-ounce duck filter cloth, but in some mills fine mesh monel metal wire covering is used. The advantage derived from the use of monel wire covering is to eliminate changing of cloths, which is necessary at least once each month when using duck covering. When using monel metal covering it is necessary to wash occasionally with weak hydrochloric acid to prevent plugging of the wire cloth and perforations in backing plates with calcium carbonate.

Continuous filters should be selected with ample capacity to do the required amount of work. A 6 x 6 foot filter is large enough for the production of 20 tons of reburned lime, and one 8x8 foot is ample for production of 40 tons of reburned lime from a soda pulp mill, but when reburning 40 tons of lime from a sulphate pulp mill it is advisable to use a filter 8 foot diameter and 10 foot face, as the sludge from a sulphate mill will not give up its water as rapidly as that from a soda pulp mill.

Should Furnish Proper Amount of Slugs

For economical burning results a rotary should be selected of such size that the proper amount of sludge can be furnished to it continuously for 24 hours. The most economical results are obtained when the rotary is crowded to its burning capacity at all times. At some mills oversized rotaries have been installed and it has been found advisable to only operate 16 hours out of 24, even when considering the loss of heat due to shutting down and starting up. A rotary 90 feet long and 6 feet in diameter is ample for reburning 20 tons of lime per day, and one 125 feet long and 7 feet in diameter will reburn 40 tons of lime per day.

The rotary is lined with fire brick, the lining being 9 inches thick at the hot end and 6 inches thick at the rear end. It is customary to spray the stack gases, and return the washings to the filter supply tank, otherwise there will be considerable loss of lime up the stack, in addition to a nuisance in the immediate vicinity of the mill.

The temperature of the stack gases varies from 600 to 800 degrees and the draught gauge usually shows from 0.2 to 0.3 inches of water as representing the pull on the rotary.

Proper Fuel for Economical Burning

The most important problem facing the operator of a lime reburning plant today is the proper fuel to use in order to procure the most economical burning results. Most plants at the present time are using producer gas, but as they have, in many cases, been obtaining poor burning economy, other methods of firing are being tried out. Some manufacturers have considered it advisable to discontinue the use of producers and are at present firing with fuel oil. At least two plants are operating successfully with powdered coal, while on the other hand some who tried out powdered coal have discontinued its use and reverted to the producer gas or fuel oil installations. The use of either fuel oil or powdered coal will make a material saving in the installation cost. In addition to this either one of these installations will save labor, as they require very little attention, while with producers it will be necessary to have at least one more man on each tour.

It is the opinion of the writer that the most economical results can be obtained with an installation using powdered coal as a fuel.

From observation of results obtained when burning producer gas it has been found that while a burning efficiency as high as 2 tons of lime per ton of coal has been obtained, there have been figures as low as 1.5 tons of lime per ton of coal, and we cannot safely assume to get better than 1.8 tons of lime per ton of coal.

Fuel oil on a coal basis, fiuring 4½ barrels of oil per ton of coal has shown a burning efficiency of from 2½ to 2¾ tons of lime per ton of coal equivalent. When using powdered coal 3 tons of lime can be burned per ton of coal, and results have been obtained some better than this figure. When every step pertaining to the manufacture of pulp is considered, if fuel oil could be obtained at a cost comparable with that of coal, it would be the desirable fuel to use for lime reburning, but there are very few pulp mills so situated that this can be accomplished.

Disadvantages of Certain Fuels

When reburning lime better results are obtained if the flame is carried back into the rotary, and the rotary not heated too much at the firing end. An oil flame is very hot and results in heating the rotary too much at the front end, necessitating relining it more often at this point than when using either producer gas or powdered coal. This is the one apparent disadvantage in the use of fuel oil. On the other hand, powdered coal carries the flame back into the rotary, distributing the heat more uniformly, and in this respect it is of advantage to use this fuel.

The main disadvantage found in the use of powdered coal is the accumulation of ballast in the burned lime, which very much retards the settling when causticizing soda and washing the sludges in the alkali room. This can be cut down to some extent by passing the sludge through baffled tanks before going to the filter and also by having the slowly moving wings of the agitator shaft in the causticizing tank about 18 inches from the bottom and washing this tank out occasionally. When all is done that can be done there is still a greater accumulation of ballast in the recovered lime when burning powdered coal than by either of the other methods; however, the burning economy is so much better that it will pay to discard some of the washed sludges to keep down this accumulation.

Comparisons

For comparisons the following can be considered for different fuel burning installations when using 40 tons of lime in a soda or sulphate mill.

Using powdered coal as fuel and discharging 15 per cent of the sludge from the alkali room into the sedimentation basin in order to keep down the accumulation of ballast:

Lime used in the alkali room		80,000 lb.
Lime sent to the recovery plant		68,000 lb.
Reclaimed lime (90% recovery)		61,200 lb.
Coal consumed (burning efficiency 3 lb. lime per lb. of coal)		20,400 lb.
Cost of coal used at $5 per ton	$51	
Cost of fresh lime used 9.4 tons at $10 per ton	94	
Total cost of the fuel and fresh lime	$145	

Using fuel oil as fuel and discarding no sludge from the alkali room:

Lime used in the alkali room		80,000 lb.
Reclaimed lime (90% recovery)		72,000 lb.
Coal equivalent (highest efficiency) 2.75 lb. of lime per lb. coal		13.1 tons
Cost of oil used at 4.5c per gal. (figuring 4½ bbls. per ton coal)	$111.42	
Cost of fresh lime used, 4 tons at $10 per ton	40.00	
Total cost of fuel and fresh lime	$151.42	

Assuming the same burning conditions with fuel oil at 6c per gal., the toal cost of fuel and fresh lime would be $188.55 per day.

Using producer gas as fuel and discarding no sludge from the alkali room:

Lime used in the alkali room	80,000 lb.
Reclaimed lime (90% recovery)	72,000 lb.

Coal consumed (burning efficiency 1.8 per lb. of coal)	20	tons
Cost of fuel at $5 per ton	$100	
Cost of fresh lime used, at $10 per ton	40	
Extra labor cost, 3 men, at $5	15	
Interest and depreciation on extra installation cost	7	
Total cost of fuel and fresh lime, considering extra labor and installation cost	$162	

If the burning efficiency were only 1.5 lb. of lime per pound of coal the above cost would be increased to $182 per day.

It does not seem advisable to pay more than 4½ cents per gallon for fuel oil as against $5 per ton for coal when using a powdered coal installation. With a producer gas installation showing a burning efficiency of 1.8 lb. of lime per pound of coal if the coal cost $5 per ton, equally as economical results could be obtained by the use of fuel oil at 5 cents per gallon, but if the producer gas installation only shows a burning efficiency of 1.5 lb. of lime per pound of coal, 5¾ cents per gallon could be paid for the fuel oil.

Using the Discarded Lime Sludge

When burning powdered coal as fuel at a plant where a sedimentation basin had previously been used, the discarded lime sludge could be passed to the basin and the flow so arranged that it passes to and deposits on one side. Lime could then be reclaimed from the other side and reburned in place of purchasing new lime, as the capacity of the rotary will be ample to take care of this additional lime sludge. If this were done the results would show a more decided advantage in favor of powdered coal as fuel.

Black ash from the leachers has been mixed with the lime sludge when reburning it in the rotary. As yet the value of this procedure is more or less problematic, but from some of the advantages derived it is advisable to make every effort to dispose of the black ash in this manner.

At almost every lime reburning plant there is a different method of handling the reburned lime. Some convey it to the alkali room, where it is discharged into a bin and used the same as fresh lime when causticizing pans of liquor, at others the reburned lime is elevated into cars, and when the cars are full they are moved by men on a track to the alkali room and dumped into the pan of liquor to be causticized, and some use a continuous causticizing system, the lime being discharged from the rotaries into an agitated tank through which carbonate liquor is circulating until properly causticized, when it is pumped from the circulating tank to settling tanks. The Mount Continuous Causticizer which has been described in trade papers is also used in connection with lime reburning.

The whole installation for reclaiming lime, including power necessary to convey the lime sludge to the reburning plant and reburned lime back to the alkali room, consumes less than 75 hp.

Lime reburning has been a big step toward the elimination of stream pollution, and at the same time has proven a profitable investment.

Chemistry in the Soda Pulp Process*

By MARTIN L. GRIFFIN
Mount Hope Finishing Co.

I HAVE often remarked that no other process of making pulp and paper involves so much chemistry or requires anything like the extensive knowledge the chemical engineer must have. This process is the oldest chemical process for reducing wood pulp. Alkalies are among the few oldest of our essential chemicals and have served the human race as no other chemical has. Of the alkalies, soda ash is the outstanding representative. Sodium is a very strong base, capable of entering into many combinations with acids, both weak and strong, and thereby producing a great variety of salts of varying degrees of alkalinity. It is possible to charge a solution of soda ash with carbonic acid to such a degree that it will show an acid reaction. Some years ago I was very much impressed with the idea that a way ought to be found to precipitate and remove a large part of the resins, waxes and other substances having acid properties from the spent liquor of the soda process before evaporation and incineration, and thereafter remove the excess carbonic acid and treat with lime, with the idea of reaching a stage of purification which would perhaps eliminate the destructive process of burning out.

We know that it is possible to precipitate these substances with mineral acids, but having done so we have barred the way to recover the soda. It is easily possible to cause the precipitation of these substances by charging under pressure with carbonic acid. The easiest way to prove it to your own satisfaction is to take a ginger ale bottle filled with black liquor to a friendly bottling establishment and charge it with the gas. The precipitate will be very bulky and the problem will be to reduce this bulk so that a good degree of separation from the liquor may be accomplished readily. It is quite possible that useful byproducts may be obtained through this avenue, as well as a more effective way to recover the soda. This experience came to me several years ago when I was not equipped with sufficient chemical knowledge or situated in a favorable atmosphere for such experimental work.

For many years wood has been cooked with a straight caustic soda solution with little attempt to abate the harsh action. With this liquor, high temperatures and pressures have been the practice, with little appreciation of the destructive action of such a treatment upon the fiber itself. Fluctuations in the yield were attributed to varying quality of the wood rather than to the process. Some appreciation of the fact that the process could be improved or a different process substituted which would conserve the yield was realized when the sulphite process became successful and the modified sulphate process was developed, but I offer the same criticism of the sulphite process as practiced, as I have made of the soda process. In many instances it is carried to such an extreme end point that destruction and tendering of the fiber are conspicuous.

Four Great Fundamental Processes

There are four great fundamental processes in applied chemistry which are paramount to all others. They comprise the reactions of acids and alkalies, oxidation and reduction. These four all enter into the processes of making chemical pulp. The soda process is not primarily an oxidizing process in any degree; neither is it a reducing process in any sense of the term, but as conducted in an atmosphere of high pressure steam, oxidation with its attendant consequences is in evidence. This, as I have said elsewhere, is not so apparent in the manufacture of pulp as it is in textile finishing, where as we know full well, high pressure steam exerts an oxidizing influence which is recognized in its tendering effects. However this may now be explained; it is now recognized that reducing sulphites and sulphides act beneficially when used in connection with the chemical processes of making pulp.

By way of contrast let us consider the sulphite process in this connection. It is well known that both acids and alkalies exert a strong hydrolyzing action, which is fundamental in both processes. In this process we have the reducing action of the sulphur dioxide carried to the extreme at the beginning of the process, gradually diminishing until the end of the cooking period when the protective reducing action of the dioxide gas gives way to oxidation. There was a time when the sulphite cooker was supposed to be on his job and not let the cook burn, and it was recognized at the time that serious consequences would result if there was any failure to blow. In the stress to make easy bleaching pulp and pulp which was half beaten before reaching the beaters, the fine edge of the knowledge of the consequences has been lost sight of. Who will deny that the results of overcooking in the soda process do not produce similar results? It has always been assumed that soda pulp was inevitably weak. Though it has been customary to cook woods of shorter fiber by the soda process, are we to conclude that the process cannot be conducted in such a manner as to yield a much stronger pulp? Much has been accomplished by shortening the time of cooking and events are tending to a better knowledge of some of the chemical factors entering.

What is known as the sulphate process has been in successful operation for several years. What the original idea and purpose of the experiments in this field was, I cannot state definitely, but if I may draw an inference from the title of the process, it is natural to conclude that the main idea was to substitute the cheap by-product salt cake for the more

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expensive soda ash, depending upon the reducing action of the organic matter in the furnace process to convert the sulphate into the strongly alkaline sulphides. As a natural consequence stronger pulp resulted, partly from the fact that these sulphides were not as harsh in their action, and partly because they exerted a strong reducing action. In the process no attempt has been made to produce a very clean bleachable pulp, as the product has found its own place in the making of fine wrapping papers. I have traversed this field to show as vividly as I can the past practice which I believe has been lacking in a full and complete knowledge of many essential features.

In view of the phenomenal growth of the association of technical chemists in the paper industry and what has already been accomplished and the strong desire to advance further, I believe we should apply ourselves to the problem of improved methods of reducing raw stock to paper pulp. We know the virtues of both the soda and sulphite process with their paramount features. Each attacks the problem from a different angle but have several overlapping factors. Shall we not investigate and attach more importance to these overlapping areas? There is nothing inconsistent or incompatible in adding sulphites and sulphides to our caustic soda liquors, nor is there anything to prevent the addition of caustic or carbonate of soda to a sulphite process liquor. There are several workers in this field now who have accomplished flattering results, but it will require a high degree of intelligence to reap the full benefits of the problem.

Cross and Bevan Chlorination Process

At this point I would like to revert to the now old chlorination process of Cross and Bevan for the analytical determination of cellulose in wood and the like. As you know the prepared sample is first treated with a 1 per cent solution of caustic soda at boiling temperature for 30 minutes. It is then well washed and exposed to an atmosphere of chlorine gas for about an hour and then washed and given a light treatment at boiling temperature with a 2 per cent solution of sodium sulphite to which about 0.2 per cent caustic soda has been added. It is then washed in hot water and may be given a very light bleach to remove last traces of impurities. I believe careful thought should be given to these three stages of treatment and the very mild treatment necessary when the conditions are made favorable. There are also certain types of raw fibers which such a mild treatment is adapted to, like the straws and esparto grass. The De Vains process participates in this formula.

Why is it that such extremes of pressure, temperature and strength of liquor have been used in our chemical cooking processes? The law of mass action states that the velocity of a reaction is proportional to the product of the reactants. We know that the greater part of the total reaction takes place easily and quickly, but that the final stages of the process take a relatively long time, and besides under influences which are destructive. Add to this the "buffer" action of the residual products and again the process is slowed up.

It is well known that if a process can be divided into stages where each stage is carried forward under mild condition, results are much superior. For instance, I have known of bleaching processes where a partial bleach has been accomplished, then a wash and the process repeated. Generally speaking manufacturers have preferred to forego these refinements for a quick process, which at the time appeared to satisfy the conditions. Other instances might be cited. It may not appear at all practicable to apply this reasoning to the cooking of soda pulp, but at least I believe the subject should receive careful study.

Again electro-chemistry has provided many important chemicals which otherwise we should not have, or at least have them commercially available. For instance, sodium peroxide is coming into extensive use for many purposes, and just as a few years ago one would not have thought liquid chlorine could compete with bleaching powder, it is today an accomplished fact. If now we consider sodium peroxide, we shall see that it is capable of two important functions joining in one operation. Its decomposition products are atomic oxygen and caustic soda, and in their point action become very effective. It is now claimed by large makers of peroxides, that in the bleaching of cotton, silk and wool textiles, sodium and hydrogen peroxides are no more expensive than the customary processes, and have some advantage in other ways. They are prepared to substitute for high pressure kier boiling, washing and chemicking, a single treatment without pressure and at temperatures below boiling in the bleaching of cotton gray goods, in much less time and at no increase in cost. I am not prepared to say whether it would work out advantageously in the soda process to use some proportion of sodium peroxide, but there is nothing incompatible in the suggestion, and it is quite possible that the usual practice might be modified so as to make a place for it.

Broader Field of Soda Process

At this point, if you are thinking only of the application of the soda process to the treatment of wood, I want to lead you into the broader field of its adaptation to treating many other papermaking straws and grasses. Here is a rich prospect for the skilled technologist and business man. Cotton and wood celluloses are very resistant to both chemical and mechanical action. They require harsh treatment to fit them for fine grade of paper. Certain straws, grasses, and bast fibers are well adapted to make high grades of paper if they are properly treated, and a modification of the soda process which will exert a mild and selective action, I believe it best adapted for this field of technical adventure in paper making. You will realize that these fibers are naturally more hydrated than wood and cotton and are therefore much more reactive at the start and will disintegrate much easier. Therefore more discriminating methods of processing must be employed. The longer and closer we study these problems the more we shall see that physical chemistry enters largely into the problems. I believe some of the newer tools in this field will give us new insights into many conditions of which we have been in ignorance. It has long been the desire of the paper chemical engineer to measure the results of beating stock so that paper of certain characteristics might be made uniformally. The problem has been attacked with intelligence by the adaptation of a special form of viscosimeter located in the beater during the refining process. I am disposed to speculate whether or not this viscosity, which is a phenonom of hydration, cannot be determined by means of the hydrogen electrode. It is certain that if we add hydroxyl ions to the stock the equivalent hydrogen ions must be in evidence and if they do not enter into combination, are capable of measurement by means of the hydrogen electrode or a suitable indicator. So it may come of the hydrogen electrode or a suitable indicator. So it may come about that we may specify degrees in beating by pH values. This is a problem I have set for myself to work out.

It may not be self-evident that these digressions are connected with the soda process, but I have attempted to show some of the fundamentals of the alkaline and acid processes which are antipodal, each possessing strong characteristics in one direction and lacking in the other; whereas, as we know, both oxidation and reduction, speaking with some liberty, are essential to the isolation of cellulose, and that therefore both processes should approach each other chemically. We may expect that alkalinity will prevail or remain in excess, because we associate saponification, detergency and dispersion with alkalinity all of which contribute to the cleansing and isolation of paper pulp. Acid processes do not perform these functions. It is not at all the function of cooking to participate in the results of "beating," but I have indicated the close relationship between chemical and mechanical hydration, and the papermaking processes will partake of both. If in the cooking of some raw materials they are sensibly hydrated it is an advantage worth while to gain, but not at the expense of yield. Such results cannot be won haphazardly, but only by a close application of chemical technology and experience.

Diamond service emblems have been presented by the American Engineering Co., of Philadelphia, manufacturers of Taylor stokers, to 32 of its employees who have been with the company for a quarter century or more. Gold medals were presented to 275 other employees with records of 5 to 25 years' service. Heading the list of those receiving the diamond medals were two machinists with records of 46 and 45 years' active service. Both are still employed daily in the shops of the company.

News Briefs from Washington

Washington, D. C., March 2, 1925.

Bureau of Standards to Test Esparto

Arrangements have been made by the U. S. Bureau of Standards for obtaining a supply of esparto, a Spanish grass which is extensively used on the continent for making paper and to a lesser extent for making a coarse cloth, in order to test its paper-making value. The grass will be subjected to a light cooking treatment before shipping in order to reduce transportation costs.

Esparto fiber's popularity abroad is thought, perhaps, to be due to its comparative cheapness, especially in countries where wood fiber costs are high. On the other hand, it is claimed to possess certain valuable qualities that wood fibers lack and therefore to be superior to wood for certain purposes. The Bureau of Standards will try it out in every way and will seek to reduce the assertions made about it to definite facts. If it should be found to excel the domestic paper-making materials in a few or in many ways, the knowledge of the fact should prove valuable.

Caroa Found to Be Good Fiber

Caroa, a fiber from a Brazilian plant, has been tested by the Bureau of Standards and has been found to be long and of small diameter. These properties, of course, tend to produce good felting and therefore to give compactness to paper made from it. An unbleached paper suitable for bag or wrapping purposes was made and was found to have unusual strength. A very satisfactory grade of bleached paper was also made.

The plant is native to eastern Brazil. Its leaves are four feet long and an inch and a half to two inches wide. The natives extract the fiber and use it to make fishing nets. Its cost in Brazil is low and the bureau thinks it can be imported from there at a profit or raised in the southern United States for use instead of rag and rope stock, which is scarce.

The Bureau of Standards is doing considerable work towards devising and producing an improved waterproof paper for lining cases, as the present methods are considered inadequate. The effect of asphaltum on the strength of the paper is at present being tested, and so far has met with favorable results, the asphaltum seeming to increase the strength. Additional tests will be necessary to decide the matter, especially by testing the strength of the paper in various ways both before and after asphalting.

A bulletin by the Bureau of the Census states that the United States production of paper during 1923 totaled 8,029,482 short tons. This exceeds the estimated peak production in 1920 by about 695,000 tons, and that of the census taken in 1921 by more than 2,500,000 tons. The increase was particularly noticeable in boards, heavy wrapping, kraft, book, hanging paper and paper bags.

Interstate Commerce Commission found on February 19 that the railway freight rating of printed waxed wrapping paper between points in official territory was unreasonable and prescribed a reasonable rating for the future and reparation for the overcharge. The defendants (Pennsylvania Railroad Company) are ordered to establish, before May 7, a rating that will not exceed third class.

Norway Production at High Level

The American consulate at Oslo, Norway, reports that last year was generally favorable for the mechanical groundwood mills, which produced 482,000 metric tons, the bulk of which has been shipped and sold. It is estimated that the 1925 production will reach 600,000 tons, the greater part of which has already been contracted for at firm prices. Present prices have shown some weakness, which is expected to be remedied during February.

The production of chemical pulp for export in 1924 was 186,173 metric tons, of which 81,000 tons were bleached sulphite, 95,000 tons unbleached sulphite, and 19,000 tons unbleached sulphate. Warehouse stocks on December 31 were estimated at 10, 12 and 10 per cent respectively.

Total exports of pulp and paper in 1924 had a value of $36,604,000.

The market for newsprint is better than was expected, both in orders and inquiries.

Later cable advices to the Department of Commerce state that industrial activity in wood pulp and paper is being maintained at a high level, and that these were among the principal exports.

Reports from Sweden and Other Countries

Cable from Sweden, February 21, to Department of Commerce says that conditions have remained static during January. Unseasonable weather has affected some domestic industries; but several export trades, among which is that of woodpulp and paper report improved business. The threatened lockout that has made the future of the industry uncertain has been postponed at the request of the government til March 16. A mediation commission has been appointed for the interval. The proposed lockout would affect 50 paper mills employing 13,000 workers, and 90 pulp mills employing 15,000 workers, and would put a complete stop to production.

The United States and England continue to be Sweden's best customers, Continental buyers making only small purchases to meet immediate needs.

Advices to the Department of Commerce say that the paper and pulp industry in Pomerania, Prussia, was dull during 1924, some of the mills working on short time and some closing down. Other mills found great difficulty in competing in world markets. Local paper producers say that it would have been more profitable to confine themselves to the production of paper and of chemical pulp, which they formerly sold in considerable quantities in Denmark, England and South America.

Commercial attache, at Riga, Latvia, reports 42 new paper enterprises begun in Latvia during 1924.

Commercial attache from Rio de Janeiro reports, February 21, that prices of European paper show firmer tendency.

Other consular reports: Owing to decline in supply, Polish pulpwood has increased from $13 to $17 in December to $20 to $24 per cord in early February. Germany is the chief buyer.

Austrian pulpwood production has virtually ceased owing to water shortage and stocks are nearing exhaustion.

Japanese paper production by the Paper Manufacturers' Association totaled 70,751,646 pounds in November, nearly half being newsprint. Sales closely paralleled production.

The Bureau of Labor Statistics, February, quotes wholesale prices from October to December and year for wood pulp, sulphite, domestic, unbleached, per 100 pounds, New York, average prices: October, 2.506; November, 2.625; year, 2.579. Index numbers (1913—100): October, 112.6 November, 115.5; October, 118.0; year, 115.9.

Index numbers are based on prices in 1913, which is rated at 100.

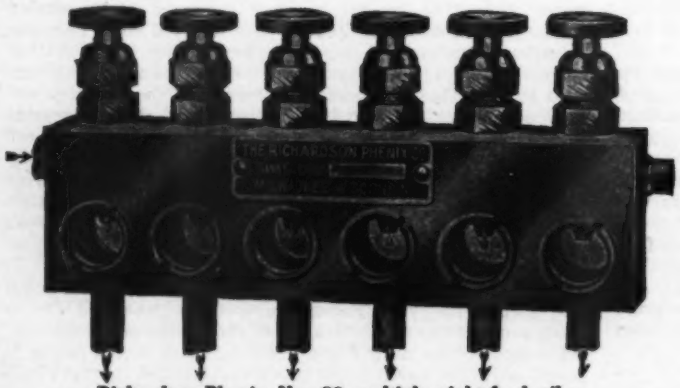
Exports of paper base stocks, including cotton and woolen rags, old manila rope, old bags, paper and twine waste, and similar shipments from Havre, France, to the United States in 1924 are reported by the Department of Commerce to have been valued at $598,977, or 44 per cent of the total exports from Havre to the United States.

Richardson-Phenix clear-vision feed oiler

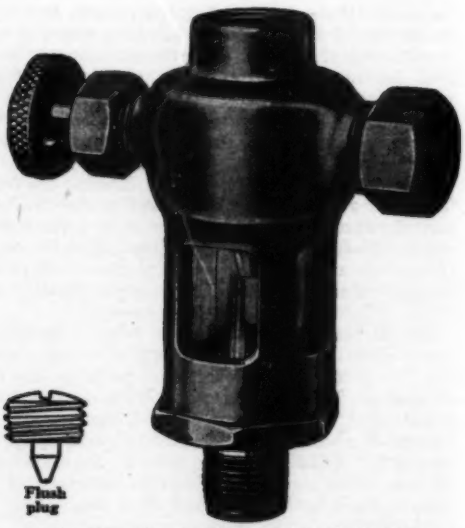
Get the right oil in the right place at the right time

with BOWSER ESTABLISHED 1885 *accessories*

endorsed by lubrication engineers everywhere



Richardson-Phenix No. 20 multiple sight-feed oiler



Flush plug

Richardson-Phenix No. 12 sight-feed oiler—4-window

Phenix sight-flow indicator

You buy the oil—good oil—we'll help keep it so.

Complete engineering service is yours for the asking.

S.F. BOWSER & COMPANY, Inc.

LUBRICATION ENGINEERS AND MANUFACTURERS

FORT WAYNE, INDIANA, U.S.A.

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OIL STORAGE AND DISTRIBUTION SYSTEMS

New England News

March 2, 1925.

Expansions Planned

Possibilities of some excellent business for the machinery manufacturers, if not for the paper makers themselves, looms as the year 1925 moves onward. At this writing we are apprised that the Great Northern Paper Co. has some eight Fourdriniers that must be replaced within the next few years, some earlier and some later on, but contracts for at least a portion of the work will probably be let this year. It is also pretty reliably reported that the Crocker, Burbank Co. is to buy a Fourdrinier and other equipment in the near future if contract has not already been placed. Then there is the addition to the Advance Bag & Paper Co. mill at Howland, Me., which, while ostensibly started to provide storage room for the company's bag stocks at the mill, may also enable them to instal a few additional bag machines. There certainly will be the space for such expansion. Meantime, Bird & Son are completing the installation of machinery for manufacturing corrugated paper boxes, an entirely new feature at the East Walpole mill. To do this, they also built a storage warehouse, and utilized the previous storehouse as an addition to their main paper mill for the corrugated department.

All in all, then, it is likely that 1925 will hold its own in expansion and machinery replacement, all of which means better and larger output for New England. New England, in other words, is still far from slipping as a paper center.

Business, however, was far from favorable. The writing paper mills in the western part of Massachusetts are operating but 80 per cent of capacity. A few exceptions of 100 per cent bring the average up, but others can show but 50 per cent production.

The American Writing Paper Co. Year

A very interesting paper was recently deposited with the Federal Equity Court, at Boston, discussing the past year of the American Writing Paper Co. It was Mr. Willson's report as receiver. The year ended with an operating loss of $289,000. Nevertheless, this was a great improvement over the previous year. Despite a reduction in gross sales to $14,151,000, the company deficit in 1924 compared to a $1,785,000 deficit in 1923, when $15,835,000, a million and a half greater volume of sales, were negotiated. The heavy loss in 1923 was partly due to adjustment of worthless accounts.

During 1924 the company reduced its controllable expenses of shipping, selling and administration to 4.05 per cent, 3.42 percent and 1.67 per cent of the total, which in each case was a substantial reduction from 1923. Mr. Wilson reported that a monthly statement had been filed with the creditors with a view to maintaining the receiver's credit. The company maintained a fully adequate cash balance of $300,000 without recourse to trade discounts or bank loans. The mills were improved in appearance and efficiency. Over 540 new lines were established with converters, distributing houses, foreign and domestic merchants outside the distributing agencies.

The company's present unpaid taxes amount to over $400,000. The item of taxes was the only one which the company was unable to adjust satisfactorily. Mr. Willson laid the deficit largely to a $270,000 increase in rag costs.

The tax matter looms as a very serious item. City officials of Holyoke are pressing Receiver Willson for settlement and have given him until April 1 to devise some means to do so. It is hard to see how the taxes can be met in full without borrowing, for a considerable cash payment out of its bank balance would seriously interfere with the operations of the company. Recent reports that the company had applied for permission to sell certain outlying mills are not founded in fact. The permission of the Boston Equity Court is essential to such a move.

Hollingsworth & Whitney Severs Connections with Union Bag

Hollingsworth & Whitney Co. have severed their arrangement of many years' standing whereby they acted as selling agents in New England for the Union Bag & Paper Co. Hollingsworth & Whitney Co. are expanding to such a size in the exclusively paper field that they have for some time considered the advisability of the move now taken. The old arrangement was entered into at the time the Hollingsworth & Whitney Co. sold its interest in the bag business to the Union company.

Under the new arrangement the Union Bag & Paper Co. product will be handled in New England by the same merchandising agencies, that is, Stimpson & Co. of Boston, L. B. Philbrick of Salem, C. M. Rice Paper Co. of Portland, and Andrews Paper Co. of Boston. The Union Bag & Paper Co. will open district supervisory offices in the Board of Trade Building, Boston, under Mr. H. S. Daniels, assisted by A. R. Cox.

Personnel Changes at Warren Mill

The S. D. Warren Co. changes of the past month have aroused much speculation and surmise, but the important fact seems to be that the issuance of the $6,000,000 bonds made possible certain things which will greatly benefit the company's operations and financial position. According to Mr. Roger D. Smith, president, the company retired its issue of cumulative first preferred 7 per cent stock at the call price of 105. It also retired a mortgage on the Cumberland mills property and the remainder was used to finance and purchase the common shares of stock held by the S. D. Warren branch of the family, consisting of Samuel Dennis Warren 3rd, Bayard Warren and others, and transfer ownership of the common stock to Fiske Warren. The latter, however, while nominally in control and a member of the board, will also relinquish active participation to the energetic combination headed by Roger D. Smith, who have taken up the work of carrying on the business. The sole active Warren, descendant of the original founder, is Joseph Warren. His father was a cousin of the founder. Joseph Warren remains as vice-president and member of the board. He will be in charge of operations and mill manager at Wesbrook. He is a graduate of Massachusetts Institute of Technology. Other officers include C. B. Morgan, treasurer; Mr. P. E. Hinckley, secretary, and George Olmstead, vice-president. Directors include the above and Jesse W. Clark and William H. Dunbar. Mr. Smith assures us that the broad policy of national distribution will be continued unchanged. Samuel Dennis Warren 3rd, the former vice-president, severs all connection with the company.

A bill has been introduced in the Maine legislature granting authority to the Maine Highway Commission to permit the Fraser Companies, Ltd., of Edmunston, N. B., to lay down two 16-inch iron pipes over the International bridge, thence to the proposed paper mill at St. Agatha, which will have a capacity of 200 tons daily of m. f. and super book. The mill will cost $2,500,000. The only possible objection to the plan is foreseen as likely to arise in Canada.

Mills of the International Paper Co., at Wilder, Vt., have been returned to full time operation after a closing lasting from last summer.

In changing the name of their company from the Poland Paper Co., of Mechanic Falls, Me., to the Waterfalls Paper Co., the company has taken a step to identify itself more closely with its product. "Waterfalls" as a watermarked line is but a post-war innovation of the Maine company, yet it had such instant success in the field that the wisdom of the change in name is not disputed by any.

An order consolidating the bankruptcy cases of the Kennebec Paper Co. and the Cushnoc Paper Companies of Augusta has been entered in the United States District Court at Portland. It is set forth that confirmation of ownership with conflicting claims would prevent the realization of the true value. This jointure is to facilitate the settlement of affairs of both companies.

By tariffs filed to become effective March 18, the Maine Central Railroad has at last complied with the orders of the State Public Utilities Commission, which last August ordered a reduction in pulpwood rates. The long-drawn-out fight between the paper companies and the railroad ends in complete victory for the industry. The New England Paper & Pulp

The BELOIT Shake

15% INCREASED PRODUCTION

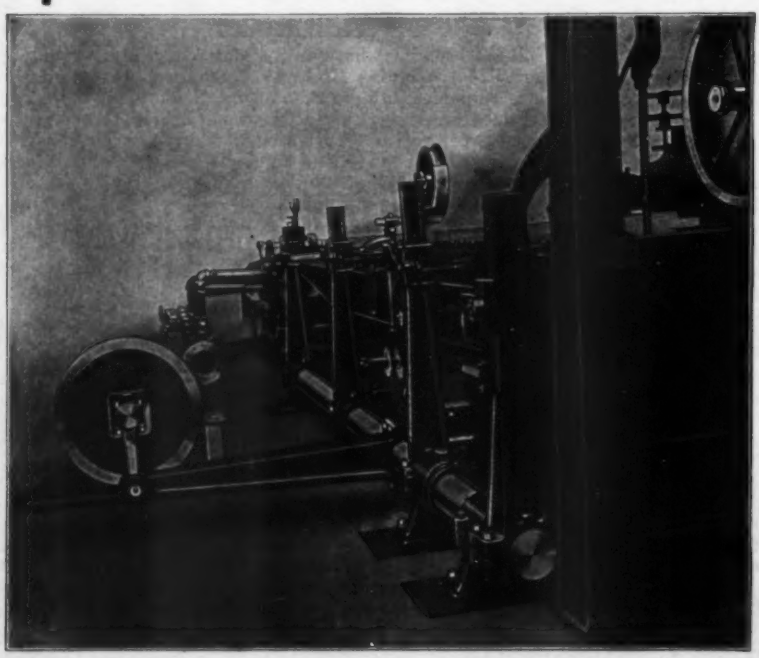
SIXTEEN orders, of which four are re-orders, demonstrate the remarkable achievements of the New Beloit Shake, which has been on the market only a short time.

In one mill its application showed an increase in production of 15% within a few days after its installation, with more than a corresponding improvement in the formation of the sheet being run.

This advancement in paper making has demonstrated conclusively on fine tissues that it can produce a better formed sheet **at a higher speed.**

Proof in abundance is at hand to prove the absolute efficiency of this New Fourdrinier:

Operating on Kraft, tests have been made over long periods of time of from 68 to 72 on a 50-pound sheet, or from 36 to 44 per cent more than the usual "point to the pound."



A recent installation on sulphite papers shows tests of 37 points on a 39-pound sheet.

On another "Beloit" machine making Kraft, the paper is testing 127 per cent, while a machine of another make in the same mill, running 25 per cent slower on the same stock, produces paper testing but 93 per cent. Thus, the "Beloit," with the disadvantage of higher speed, is producing a **better formed** and higher test sheet than that made on the other.

These and many similar facts will convince the most skeptical that the superiority and efficiency of the revolutionary "Beloit" Fourdrinier has been proved in practice and not by theory.

Write for Bulletin No. 9 for further information and facts.

The NEW BELOIT FOURDRINIER

Beloit Iron Works **Beloit, Wis., U.S.A.**

ESTABLISHED SINCE 1858

Traffic Association is now submitting claims of reparation based on excess rates charged since February 5, 1924. The association is acting for non-members as well as members. Interest is asked for as well as reparation.

The offices of the New England Paper & Pulp Traffic Association have been removed as of March 2 to new and enlarged quarters in the building at 101 Milk street, on the fourth floor.

Massachusetts Legislative Committee on Labor and Industries has asked leave to withdraw a bill asking for appointment of a committee to investigate the paper industry of the state.

The Boston Paper Trade Association will hold its annual meeting and banquet on the evening of March 18, at the Algonquin Club, Boston. President William B. Stevenson will preside and two excellent speakers are promised by Secretary F. Ben Tracy. Annual election of officers will take place on this evening also.

We understand that Attorney Eugene A. Lynch, who has been retained by Holyoke to fight its tax suit against the American Writing Paper Co., recently conferred with attorneys for the company in New York.

Report of the Eastern Manufacturing Co. for 1924 shows a rather poor result. The company shows a net profit of $93,000 compared with $674,000 profit for the past year. The company's funded debt was reduced by $50,000 and their working capital for the year is slightly greater.

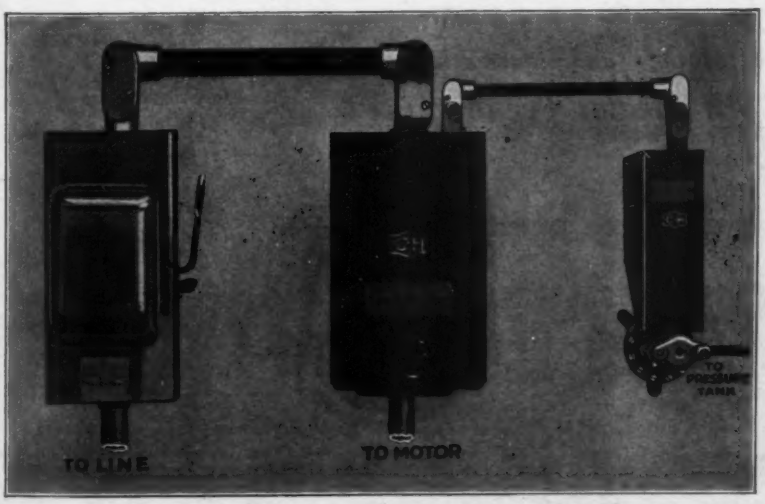
Frank Van Da Linda

Frank Van Da Linda, vice-president of Stone & Forsyth Co., died at the Hotel Lenox, Boston, recently, where he had made his home for some years. He is survived by a daughter and a son.

Pulpwood operators of northern Maine approved the proposal of the Aroostook Valley Railroad to run an extension through the heart of the county tapping some of its richest timberlands. It was suggested as not only a suitable means for developing new sources, but a railroad line of immense value in transporting wood at present being cut, to southeastern Maine mills. A recent conference of the operators in Bangor voted unanimously in favor of the project and will voice their approval to the Interstate Commerce Commission.

Simple Automatic Pressure Tank Control

The accompanying illustration shows a typical safe wiring and installation arrangement for the automatic control of a small A. C. single phase motor-driven pump outfit. The main line switch is of the enclosed outside-operated type mounted alongside of the Cutler-Hammer double-pole magnetic switch and pressure-actuated switch. The latter is connected by pipe to the tank and electrically to the magnetic coil of the magneto switch so that when the pressure in the tank drops to a predetermined low value the magnetic switch is caused to close, thus automatically connecting the motor on the line. When the pressure reaches the desired high value, the pressure switch opens, the magnetic switches drop out, and the motor and pump come to rest.



Southern News

March 2, 1925.

Mobile Paper Mills to Start Operating Soon

The new mill of the Mobile Paper Mills Co., located in Chrichton, a suburb of Mobile, Ala., which was started in April, 1924, will soon be ready for operation. The products of the new mill will be boxboard and roofing paper.

The Downingtown Mfg. Co., of East Downingtown, Pa., furnished the 76-inch 5-cylinder machine. The machine is equipped with 60 dryers, two stacks of calenders, a set of reels, Hamblet cutter, and three-shaft Manning winder. The three 1500-lb. beaters were furnished by the E. D. Jones Mfg. Co., of Pittsfield, Mass., and the two Jordans by the Dillon Machine Co., of Lawrence, Mass.

The machine and beater room are driven by a 300 H. P. Hamilton-Corliss engine and two 100 H. P. engines built by the Harding Pynes Mfg. Co., of Birmingham, Ala.

The mill will use waste from a nearby sawmill for fuel.

The officers of the company are Joe Walsh, president; Marshall Turner, vice-president; R. G. Milling, secretary-treasurer, all of Mobile, Ala. B. H. Macke is the general manager and Carl Piles, superintendent. Mr. Macke and Mr. Piles were formerly with the Gulf Paper Mills Co., which burned in December, 1923.

E-Z Opener Bag Co. Improving Plant

The kraft mill of the E-Z Opener Bag Co., at Braithwait, La., was shut down on January 24, to make a number of changes in their machine room, which, it is expected, will increase the production from 28 to 35 tons daily.

The wet end of the machine is being remodeled and a Beloit removable Fourdrinier installed. The drying capacity will be increased by the addition of ten more dryers, while new Beloit reels are also being installed. The drying economy will be increased by the installation of the Ross vapor absorption system.

Southern Cotton and Paper Co. Making Improvements

The Southern Cotton and Paper Co., of Alton Park, Tenn., is installing digesting equipment to increase the capacity of their pulp mill from 10 to 20 tons daily. In the paper mill, a pasting machine is also being installed. Approximately $30,000 will be spent for the mill improvements. The company was recently awarded a government contract for 200,000 pounds of paper, which will necessitate their running on double shift for two weeks.

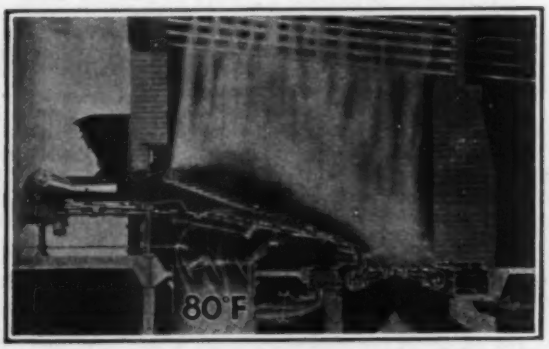
The Southern Cotton and Paper Co. produces a high grade of cotton linter pulp by a special process and is the only mill in the south making fine papers, bonds, ledgers, de luxe book, cotton pulp and absorbent cotton.

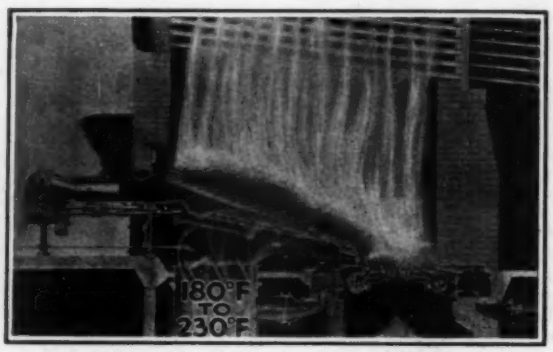
Canton Bids for Industries

With the main objection to further expansion of industry in the city removed when the preliminary work was started recently on the first unit of the new power station of the Asheville Power and Light Company, the Civitan Club of Canton, N. C., has become interested in attracting new industries to the city.

The new power station, which will represent an investment of $12,000,000, is located on the Pigeon River, sixteen miles below

Better Furnace Conditions





C-E AIR HEATERS PREHEAT COMBUSTION AIR

This heat is reclaimed from the stack gasses. This results in better combustion, increased heating absorption of the boiler due to increased radiation from the fuel bed, higher CO^2 and less combustible ash

Write for data and information on
C-E Air Heater Performance

INTERNATIONAL COMBUSTION ENGINEERING CORPORATION

Combustion Engineering Corporation

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Offices in Principal Cities Throughout the World

Fredarick Multiple Retort Stokers
Type E Stokers
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Self-Contained Stokers

Green Chain Crate Stokers
Green Cast Iron Hoppers
Green Pressure Waterbacks
Quinn Fuel Oil Equipment
C-E Fin Furnace

Lopulco Pulverized Systems
Coxe Stokers
Grieve Grates
CE Air Heaters
CE Tube Scraping Device
Combusco Water Seal Conveyers

Canton. Water will be carried in a tunnel four and a half miles long, which extends through two mountains and will be delivered to the turbines at a head of 600 feet, developing 65,000 horsepower. This will be available in Canton, Asheville, Charlotte and other points in Western North Carolina.

Canton is a thriving city of 6,000, located on the Southern Railroad, 18 miles from Asheville, in the heart of the Blue Ridge Mountains, a section of the country noted for its beautiful scenery and all-year climate. The Champion Fibre Company, one of the largest pulp mills in the country, which is unique in being the only mill producing the three kinds of chemical pulp, soda, sulphate and sulphite, is located here. The city boasts of two schools, nine churches, two banks, with total resources of $1,100,000. A modern Y. M. C. A., with a gymnasium, swimming pool, etc., which would do credit to a larger city, is the community center of the town. Recent improvements in extending the pavements have made the city modern in every respect.

The conditions here are exceptionally suitable for the location of any plant using paper or other wood products as raw materials, such as printing, box, carton, or similar establishment. Any organization coming to the city will be assured of the co-operation of the citizens.

Mr. R. H. Stevens, formerly with Joseph H. Wallace & Co., is now chief chemist of the Bogalusa Paper Co., of Bogalusa, La. Mr. Stevens takes the place of Dr. H. L. Joachim, who recently resigned to go with the Central Paper Co., of Muskegon, Mich.

New York City News

New York, March 2, 1925.

Pulp Importers Elect Officers

The annual meeting of the Association of American Wood Pulp Importers was held at the Uptown Club, New York, on February 5, at which Alexander J. Pagel, of Pagel, Horton & Co., New York, was re-elected president for the ensuing year. J. F. Patton, of the J. F. Patton Company, was re-elected vice-president; O. A. Wales, of Johaneson, Wales & Sparre, Inc., was again made secretary, and O. Hylin, of the Lagerloef Trading Company, Inc., was again chosen treasurer. These officers, together with William H. Anders, of the Perkins-Goodwin Company, compose the Board of Directors of the association. Howard Atterbury, of Atterbury Bros., was elected National Councillor, and J. A. Millar, of the Scandinavian Pulp Agency, Inc., was named substitute National Councillor.

A Committee on Admissions elected consists of Hans Lagerloef, of the Lagerloef Trading Company, Inc., chairman; Nils R. Johaneson, of Johaneson, Wales & Sparre, Inc., and S. Willey, of Nilsen, Rantoul & Company. A new Nominating Committee was elected, consisting of J. A. Millar, of the Scandinavian Pulp Agency, Inc.; Fred Enders, of Bulkley, Dunton & Co., and J. T. Lea, of the E. M. Sergeant Company. These officers and committeemen will serve until the next annual meeting of the association on the first Thursday in February, 1926.

The Select Paper Co., Inc., jobbers, of 219 East Twenty-third street, New York, recently filed schedules in bankruptcy showing liabilities of $14,123 and assets of $2,450, main item of which is stock and accounts in the sum of $2,-300. Principal creditors listed include Grand Lake Company, $3,055; Brooklyn Standard Bag Company, $1,880; Columbian Rope Company, $1,265, and the Hoffman Corr Mfg. Co., $1,047.

The New York office of the Westfield River Paper Co. has been removed from 350 Madison avenue to 501 Fifth avenue in connection with the Berton C. Hill Company.

The firm of Victor Galaup, Inc., has been organized and incorporated under New York State laws to deal in and import papermaking rags and other materials. Offices have been established at 260 West Broadway, New York, and the company will represent as sales agent in this country Verdier-Dufour & Cie, of Paris, France; Victor Galaup, Ltd., of Dewsbury, Eng.; Import-Export of Frankfort, Germany, and Verdier, Dufour & Co., of Prado, Italy. The concern is under the management of Louis Causse.

The Mutual Paper Co. has moved from its old location at 185-87 Canal street to its new building at 129-131 Greene street between Prince and Houston streets, where it occupies the entire building, stocking a complete line of wrapping and tissue papers.

Among the foreign visitors in New York in February was Aldo Benoni, of the firm of Battista & Aldo Benoni, of Padova, Italy, large exporters of papermaking rags to the United States. Mr. Benoni spent several weeks here, staying at the Hotel Pennsylvania and calling on importers and paper manufacturers.

Ralph Bretzner has resigned his connection with the American Baltic Corporation, wood pulp importers of 10 East Forty-third street, New York, both as vice-president and director. Mr. Bretzner has not decided on his plans for the future as yet.

James I. Kaiser, European representative of the E. J. Keller Company, Inc., importers of papermakers' supplies of 200 Fifth avenue, New York, arrived in New York a few days ago for a visit in this country.

The engagement has been announced of Kenneth Staley, vice-president of the Henle Wax Paper Co., of this city, and Miss Helen Barnwell, also of New York. Mr. Staley's bride-to-be is a daughter of the late Bishop Robert Woodward Barnwell of Alabama, and is a descendant of the Barnwells who were Royal Governors of South Carolina. Mr. Staley came to New York from Baltimore, Md.

The next regular meeting of the Box Board Association is scheduled for March 26, at the Commodore Hotel, New York City, 10:30 a. m.

The Greenwich Paper Company, Inc., of New York, has filed notice of a change in name to the Greenwich Envelope Co., Inc.

Foreign Trade Opportunities

Additional information regarding the following foreign trade opportunities issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce may be obtained from the Bureau in Washington, D. C., or its branch offices. It is requested that the number of the inquiry be given at all times.

No. 13612—Paper cutting, folding and printing machines, and paper of all classes. Bordeaux, France. Purchase desired.

No. 13600—Paper, full line. Alexandria, Egypt. Agency desired.

No. 13704—Paper cups, crimped sides. San Luis Potosi, Mexico. Purchase desired.

No. 13701—Paper and stationery. San Salvador, Salvador. Agency desired.

No. 13702—Paper, all kinds. Alexandria, Egypt. Agency desired.

No. 13679—Chemicals for the paper trade. Toronto, Canada. Agency desired.

No. 13819—Drawing paper. Amsterdam, Netherlands. Purchase and agency desired.

No. 13820—Labels, paper and cardboard, and materials for their manufacture. Cologne, Germany. Purchase and agency desired.

No. 13821—Old newspapers. Bombay, India. Agency desired.

No. 13759—Paper. Piraeus, Greece. Agency desired.

No. 13769—Rugs and carpets made of paper. Stockholm, Sweden. Agency desired.

No. 13807—Rosin for paper and color manufacture. Copenhagen, Denmark. Agency desired.

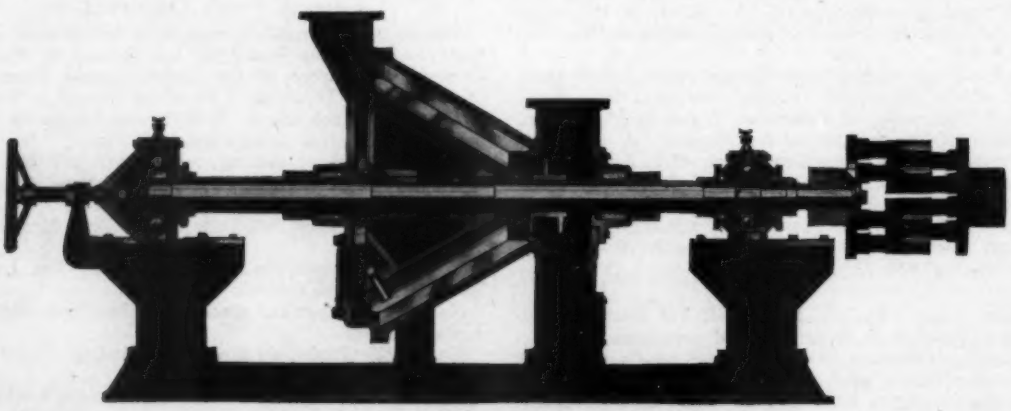
IT'S NEVER TOO EARLY TO CLAFLINIZE

EVERY noteworthy improvement has as its inception the idea of greater service at less cost in effort or money. In designing the new Claflin Refiners, the basic idea was to produce a refiner which would fulfill every beating requirement, withstand the hardest use and abuse and deliver the greatest percentage of properly beaten stock to the paper machine. To say that this objective has been reached is better proven by the fact that many users say the Claflin does better beating, brushing and refining; uses less floor space and power than similar types of Refiners. In fact "Claflins can't be beat for stuff that is hard to beat."

No stock is too difficult for the Claflin to handle. The Claflin makes a continuous beating operation possible, a fact which has many distinct advantages. It is now a proven fact that the Claflin cannot be excelled for Rope Manilla, Leather Board, Sulphite Screenings, Wall Board, Kraft Paper and waste from Pulp Stones. When used on Sulphite Screenings, the waste pile is smaller and the profits bigger.

A complete unit will handle the most difficult stock direct from the cooker and prepare it for the paper machine without any necessity of regular beating machines. The pulp will be stronger, finer and more uniform. Therefore—

IT'S NEVER TOO EARLY TO CLAFLINIZE

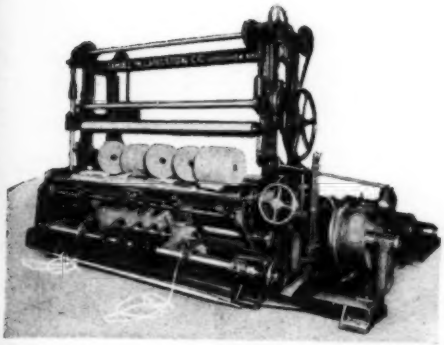


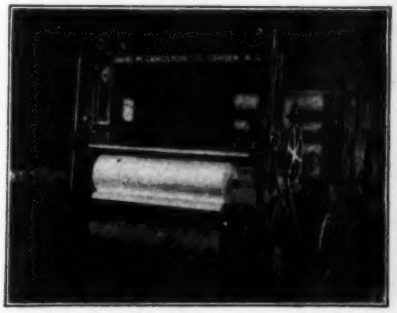
Showing Cross-sectional View of Claflin No. 2

Claflins are built in three sizes

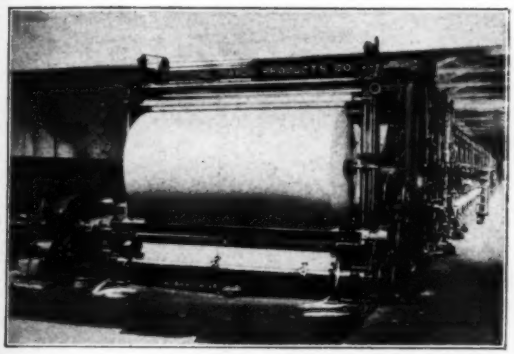
Write for Catalogue

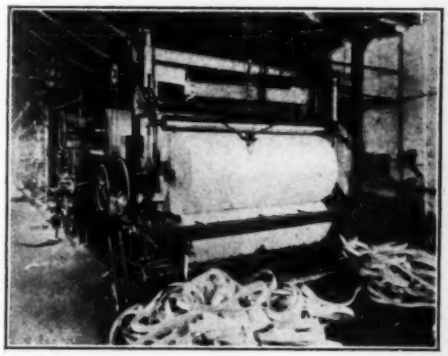
HERMANN MANUFACTURING CO., Lancaster, Ohio

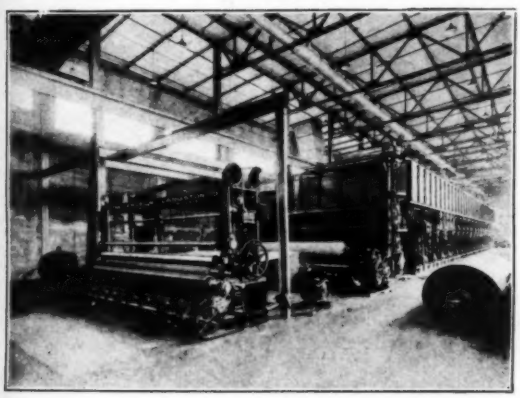




WINDERS AND REWINDERS







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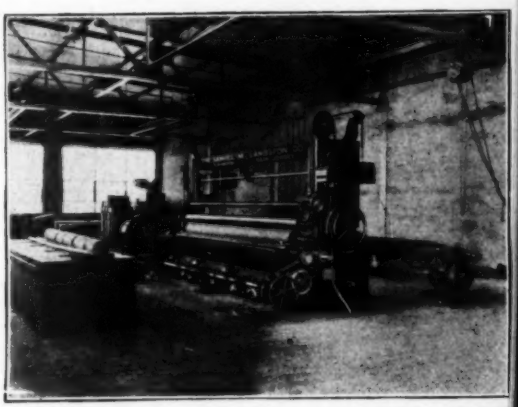

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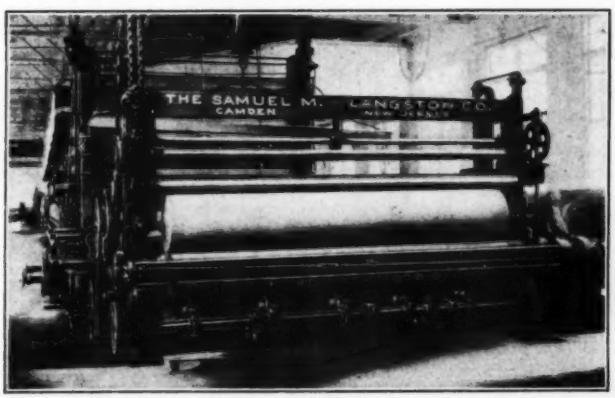

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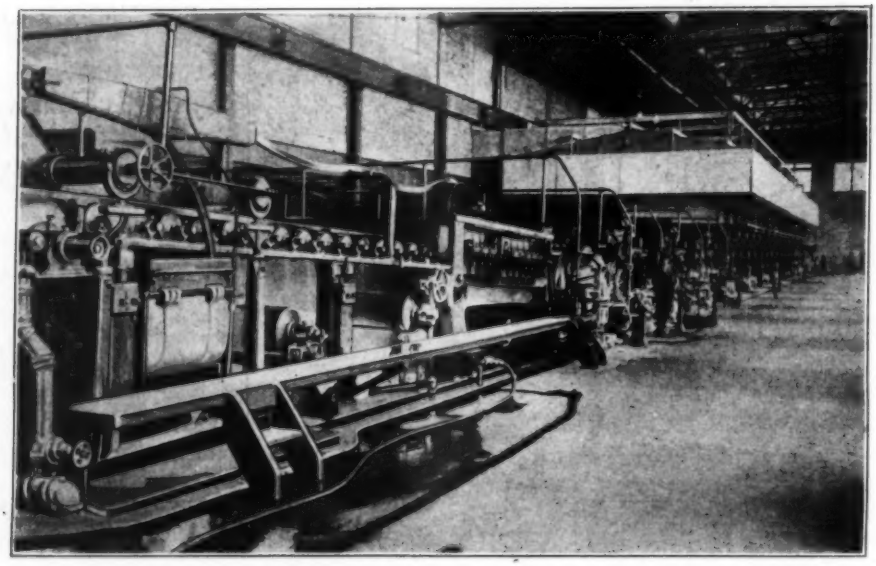

234" Walmsley mechanically operated newsprint machine installed at the Donnacona Paper Company's Mill, Donnacona, Que.

A performance that is seldom equalled

The machine illustrated above on January 21st, 1925, running 775 feet per minute producing standard newsprint, 32-lb. basis, trimming 210", turned out 103.4 tons in twenty-four hours. Maximum possible production at this speed and trim 104 tons. Operating efficiency 99 per cent.

Charles Walmsley & Co. (CANADA) LIMITED

Office: Montreal.

Works: Longueuil, Que.

Canadian Section

Montreal, March 2, 1925.

Pulpwood Export Much Controverted Topic

The question of the exportation of unmanufactured pulpwood cut from freehold lands was strongly thrown into the limelight by the action of the Canadian Pulp and Paper Association, which adopted unanimously a resolution in favor of enacting such measures as should be deemed advisable and suitable for preventing exportation of unmanufactured pulpwood out of Canada.

Very energetic protests have been voiced by the American Paper and Pulp Association, the National Publishers' Association, and the Canadian Pulpwood Association; while on the other hand the United Farmers of Quebec at a recent convention declared themselves in favor of an embargo. The matter rests in the hands of the Federal Government, and it is pretty hard to forecast just what it will do. There still remains the report of the Pulpwood Commission, which was tabled in the House of Commons during the last hours of the 1924 session, and on which no action has been taken as yet. About the only safe bet is that the government will adopt the policy which it will consider will bring it the largest number of votes, so that the question really resolves itself into which side will succeed in bringing public opinion around to its point of view.

All kinds of arguments are being adduced by both sides, some of which are so absurd that they can be seen through very easily. But the fact that the Quebec government is opposed to the embargo, while the farmers, who would appear to be the most interested in having free exportation, are in favor of it, shows that there is certainly something to say for both sides of the question.

International Paper to Acquire Riordon Properties

International Paper Company has just announced plans for readjusting its capital structure to permit acquisition of the Riordon properties. This will include a new issue of seven per cent preferred stock, a six per cent bond issue amounting to $22,500,000, and increase in the common stock from $20,000,000 to $25,000,000.

Plans for the acquisition of the Canadian properties are well advanced and the necessary notices to stockholders of International and to the bondholders of Riordon will be sent out soon, it is said.

Walmsley's Secure Wayagamack Contract

The contract for the equipment for the new paper mill to be erected at Three Rivers, Que., for Wayagamack News, Ltd., has been placed with Chas. Walmsley & Co., Ltd., Bury, England. The contract covers the whole of the equipment for the groundwood mill, beater house and paper machine room for the new mill, including all electric motors, switch gear, pumps and piping. It comprises motor-driven caterpillar grinders, coarse screens, fine screens and dehydrators, sulphite pulp shredder, willow and blowing plant, beating engines and driving motors, motor-driven refining engines and stock chests, two high-speed 164-inch newsprint machines, to operate at 1,200 feet per minute, complete with sectional electric driving gear with steam engine generator sets, two motor-driven two-drum winders, compressed air system, broke breakers, pumps and motors.

The whole of the equipment is to be shipped within eight months, and the contract is expected to provide work night and day for Walmsley and its subsidiary companies.

Co-operation at Abitibi

The special meeting of all the employees of the Abitibi Power and Paper Co.'s mill, which was held a short time ago in the Iroquois Falls town hall to talk over the mill program for 1925, was very largely attended. R. A. McInnis, the mill manager, addressed the meeting at considerable length, going into great detail of the work done in 1924 as a guide to what could be done and had to be done in 1925. Every department, he said, had made a very decided improvement.

He then gave illustrations from other mills showing that in some ways they had an advantage over Abitibi, and it was necessary to meet these. He next outlined what had to be done in 1925 to meet conditions in the industry. He went into great detail of the operations of 1925, showing what had to be done. He gave many illustrations, so that every man had a good idea of where he fitted in the plant.

Mr. McInnis was given a very attentive hearing, and a great round of applause when he finished. The interest taken in his very lucid address was shown by the fact that a pin could have been heard drop at any time.

The Federal Government, by an order-in-council, has approved the application of the New Brunswick Hydro Commission, and granted authority to proceed with the Province's hydro project on the St. John River, including the construction of a dam above Grand Falls. The application will come before the International Joint Commission on March 25.

Assets of Prince Rupert Company Sold

Sale of the assets of the Prince Rupert Holding Company, which bought up the mill and timber limits of the former Prince Rupert Pulp and Paper Company, when that company was foreclosed by the bondholders, was recently announced, J. A. Smith, of the Smith-Dollar Company and formerly of the Brunette mills, being the purchaser. Mr. Smith has incorporated the Prince Rupert Spruce Mills, Limited, with $1,000,000 capital to handle the property. J. A. W. Bell, former manager for the late J. E. Emerson, is interested in the new company.

It is understood that approximately $300,000 was paid for the assets. The sawmill at Prince Rupert is to reopen shortly, providing that certain concessions can be obtained from the city corporation, and the new management hopes soon to realize the Prince Rubert Pulp and Paper Company's original plan of establishing a pulp mill in the North.

Record Year for Shawinigan

As was generally expected, the financial report presented to shareholders at the annual meeting of the Shawinigan Water and Power Co., Ltd., showed that enterprise to have broken all previous records in volume of business, and both gross and net earnings, during the year ended December 31, 1924. The net profits after all charges, including a liberal appropriation for depreciation, were equivalent to 8.47 per cent, as compared with 8.15 in 1923 and 7.89 in 1922.

A point of special interest to the pulp and paper industry is the fact that a large block of power from the recently completed development at LaGabelle is being sold to some of the St. Maurice Valley pulp and paper mills, for the purpose of generating steam, and this is estimated to have reduced by some 70,000 tons the amount of coal which had to be imported into the province.

Another interesting feature of the report is the announcement that the chemical plants which the company had erected for war purposes, and which stand in the books of the company at a value of $2,500,000, are now being operated at a profit.

Fraser Acquires Stetson-Cutler

It has been announced that Fraser Companies, of Edmundston, N. B., have purchased control of the interests of Stetson-Cutler & Co., Ltd., including seven subsidiary companies in Maine, who for many years have operated a valuable and extensive lumber business in the provinces of Quebec and New Brunswick. Through this transaction Fraser Companies acquire control of approximately 2,100 square miles of lease-

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hold timber lands in the provinces of Quebec and New Brunswick, and about 50,000 acres of freehold timber lands in New Brunswick. It also obtains control of the operation of several large sawmills located for the most part in the vicinity of Campbellton and St. John, N. B., which have an annual manufacturing capacity of approximately 60,000,000 feet b.m. of lumber.

While the amount involved in the transaction has not been stated, the Fraser Companies, Ltd., are issuing $1,950,000 7 per cent cumulative redeemable revertible preferred stock to finance the purchase of the capital stock of the Stetson-Cutler Co., as well as for general corporate purposes.

The effect of the deal has been that the Fraser Companies have placed their own officers in charge of the Stetson-Cutler Co. and will operate it as a unit of Fraser Companies, thus making it unnecessary to transfer the licenses on 1,125 square miles of Crown timber land in New Brunswick, on which transaction $22,250 would have had to be paid in fees to the province for the transfer.

The purchase is said to have been made in connection with the Fraser Companies' plans for a new paper mill at Madawaska, Me., across the St. John River from their pulp mill at Edmundston, N. B.

Good Showing by Howard Smith Paper Mills

Howard Smith Paper Mills, Limited, in the annual financial report for the year ended December 31st, 1924, shows income somewhat lower than in the preceding year, but the reduction was far from being as drastic as generally expected, and in many respects the report is one of the best in the history of the company. This is particularly true of the balance sheet portion of the exhibit, where distinct improvement has taken place, with working capital substantially higher.

Notwithstanding the increase in interest charges due to the new issue of bonds last year, and a sharp increase in the allowance for depreciation, the company shows nearly 5 per cent on common, as compared with 8.7 per cent in 1923 and 7.5 per cent in 1922.

Death of Former Paper Man

The death occurred in Montreal recently of Dugald McCallum, who for many years was engaged in the paper trade in Montreal and was well known in publishing and printing circles. He was in his 69th year and had been ill for some time prior to his death.

The late Dugald McCallum was born in Paisley, Scotland, and came to Montreal forty years ago, residing here ever since. He had been engaged in the paper trade in Scotland, and on arriving here became connected with the old firm of Austin & Robertson, with whom he was engaged in the sales department for twenty-five years. Later he became general manager of the Royal Paper Mills, of Montreal, until their absorption by the Brompton Company. He then joined the sales department of the Canada Paper Co., with which he remained until his final illness.

He is survived by his widow (Penelope Ellen French, of Montreal), one son and one daughter.

At a recent meeting of the pulp, sulphite and paper mill workers held at Iroquois Falls, Ont., John Vanier was elected president, P. J. Walsh vice-president, Jas. Spence secretary, J. S. Brown financial secretary, and A. A. Howard treasurer.

Plans are said to have been completed through which 30,000 horsepower developed at the Grande Décharge by the Duke-Price interests would be supplied to Donohue Brothers' mills at Murray Bay. It is said that the present mills of the last-mentioned company would be enlarged, and that a paper mill will be erected. The power is expected to be available early next fall; by that time, transmission wires will be installed from the Grande Décharge to the North Shore of the St. Lawrence. In all probability the power transmitted to the eastern section of the province will come through those lines.

Joseph Kilgour, who was president of Kilgour Brothers and of Canada Paper Co., and who recently died in Florida, left an estate valued at $1,500,000. His will provides for a large number of legacies to near relatives, and one of $20,000 to the trustees of the Presbyterian Church at Beauharnois, who are to pay one-half of the interest to the minister in addition to his salary and use the other half to keep the graves of the testator's family in order. Provision is also made for distributing $175,000 among the employees of Kilgour Brothers.

Quebec Paper Mills Become Anglo-Canadian Pulp and Paper

The Public Bills Committee of the Legislative Assembly of Quebec put through the bill incorporating the Anglo-Canadian Pulp and Paper Company. The company sought first to be incorporated as the Quebec Paper Mills, Ltd., but objection to the name was raised on the ground that it is too much like that of the Quebec Pulp and Paper Mills, which was recently incorporated to take over the Saguenay interests, and the new name was chosen.

F. W. Clarke, of the Gulf/Pulp and Paper Co., is the promoter, and is understood to represent the Rothermere interests. The bonds will be floated in England, hence the bill includes ratification of the lease from the province to the company, of the forest areas in the Manicouagan basin.

The St. Maurice Lumber Company, which is the Canadian subsidiary of International Paper Company, has given notice that it will present an act at the present session of the Quebec Legislature asking permission to construct and operate railways to the counties of Temiscamingue, Pontiac, Hull, Labelle, Argenteuil, Terrebonne, Montcalm and Joliette. The same powers that the law gives it over its own water powers will be sought by the company in connection with water powers leased from Federal and provincial governments.

The annual general meeting of the shareholders of the Wayagamack Pulp and Paper Co., Ltd., was held at the head office of the company, Three Rivers, Que., on the 10th of February, and the following directors were elected: Norman J. Dawes, G. H. Duggan, Hugh Mackay, K. C., Alexander Maclaren, J. F. Taylor, James W. Pyke, and C. R. Whitehead. At the subsequent meeting of the directors Mr. C. R. Whitehead was elected president, and Mr. James W. Pyke vice-president.

The Gulf Pulp and Paper Co. have obtained permits to cut timber on a block of burned forest located in the basin of the Ste. Marguerite River, on an area of about 50 square miles. In this case the auction affected the stumpage dues, and five cents over the regular price of $1 per 1,000 feet was paid. In addition to this payment the bidders have to fulfill certain other engagements. The Gulf Pulp and Paper Co. already hold considerable rights on the north shore of the St. Lawrence River.

Courtauld's Artificial Silk Plant Nearing Completion

Buildings for the plant of Courtaulds, Limited, at Cornwall, Ont., have recently been completed, and operations are expected to start this summer.

The mill building is a facsimile of their Nuneaton mill in England, and all plans and layouts are by the firm's engineers at Coventry. The greater portion of the special machinery is manufactured in their own machine shops at Coventry, and installation of plant and machinery being installed on site is being carried out by the firm and is 50 per cent installed.

The buildings were erected by the Foundation Company of Canada, Limited, with Messrs. Canadian Vickers as sub-contractors for the steel structure. The walls are of brick, and floors of concrete, while some floors are special acid brick on asphalt over concrete.

Provincial Paper Had Better Year

Manufacturing profits of Provincial Paper Mills, Limited, for the year ended December 31st, 1924, amounted to $878,012, which is approximately 43 per cent in excess of 1923 manufacturing profits, which stood at $493,333. The 1924 operating results also compare favorably with 1922, when profits amounting to $729,261 were shown. The usual dividends were paid at the rate of 7 per cent on preferred and 6 per cent on the common stock, aggregating $329,000. The surplus carried

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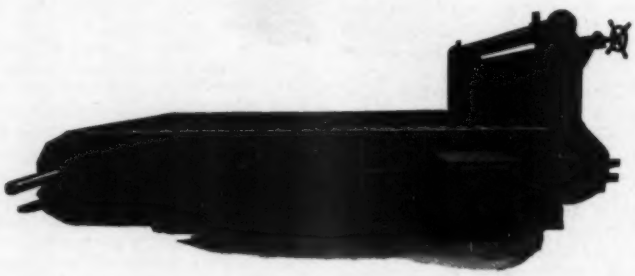

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forward into 1925 in the income account stood at $713,921. The year's profits were equal to 25.28 per cent of the preferred stock outstanding, and 9.10 per cent on the common stock.

The working capital position has been appreciably improved, from $1,198,597 in 1923 to $1,471,320.

The company's groundwood mill at Port Arthur was doubled in capacity during the year. In addition a storehouse was built at Mille Roches. The additional capacity of the Port Arthur mill accounts in large measure for the better operating results achieved by the company during the year.

Big Lawsuit Amicably Settled

Settlement has been reached in the suit by Albert J. H. Eckardt against the Cascapedia Lumber Company for an accounting, which had been proceeding before Mr. Justice Logie, in the non-jury assizes, at Toronto. The property involved in the lawsuit is valued at $26,700,000, rendering the case the most important, as far as financial interests are concerned, that had ever come before the Toronto courts.

On the advice of Mr. Justice Logie, the parties had a conference and reached an agreement, whereby A. J. H. Eckardt is to accept stock valued at some hundreds of thousands of dollars, while his son, W. P. Eckardt, has been added to the directorate.

About 2,700 square miles of timber limits, three sawmills, two paper mills, a pulp mill, and extensive water power development works are included in the company's holdings, which are very close to the Nova Scotian coal fields.

Davis Pulp and Paper Co., Ltd., which recently took over the old Foley plant at Thorold, Ont., has been granted Dominion Incorporation, with a capital stock of $1,500,000. In addition to their pulp and paper operations, the company is authorized to acquire the Port McNeil Timber Co., Ltd., and the Howe Sound Pulp and Paper Co., Ltd. Toronto lawyers are mentioned as the incorporators.

According to E. L. Jones, general manager of the Spruce Falls Co., Ltd., Kapuskasing, Ont., the mill is running at capacity, as it did during 1924, on sulphite pulp. Preliminary surveys are being made for locating lines to the proposed development of the company, but nothing has been decided as yet on the proposed power extension.

H. F. Bullard, who for the last two years has been manager of the Dryden Paper Co., Dryden, Ont., has accepted a position as assistant to Maurice Hoopes, president of Finch, Pruyn & Co., Inc., Glen Falls, N. Y., and will enter on his new duties in the near future. Some eight years ago Mr. Bullard became associated as chemist with the Laurentide Co., at Grand'Mère, Que., which he left to manage the mill at Dryden.

In order to cut down on freight charges on export pulpwood from the head of the Great Lakes, arrangements have been made for the installation of a rossing equipment, which will be placed on a large scow to be moved from place to place in the harbor at Fort William, Ont. With this installation in operation the exporters of wood hope to save considerable money on shipments.

Annual Meeting of Canadian Pulpwood Association

At the annual meeting of the Canadian Pulpwood Association, held recently at the Chateau Frontenac, Quebec City, officers for the coming year were elected and addresses were delivered by Angus McLean, of Bathurst, N. B.; Robson Black, of Ottawa, manager of the Canadian Forestry Association, and Gustave C. Piché, chief forester of the province of Quebec. The latter outlined the reforestation plan of the Quebec government, which called for 5,000,000 acres to be converted into land that would produce a great volume of pulpwood.

A very strong stand was taken against interfering with the free sale and export of Canadian pulpwood to the United States.

The Western Quebec Paper Mills, whose plant is located at St. Andrews East, Que., and whose head office is in Montreal, are now operating on a twenty-four-hour basis making high-grade lightweight specialties. The production of seven tons daily is likely to be increased. The output includes tissue paper and paper for the purpose of light pattern making. In the past these grades have been largely imported, and in this way the Western Quebec Paper Mills are replacing foreign papers on the Canadian market.

For some weeks the Saguenay Power and Pulp Corporation have been selling groundwood to Price Brothers, thus enabling the latter to maintain output in spite of the damage recently incurred by the landslides at Kenogami, Que. It is understood that the arrangement has proved mutually satisfactory, providing Saguenay with additional sales during a period when pulp is often stored and furnishing Price Brothers with a dependable supply of groundwood in an emergency. It is reported that the friendly relations which have resulted have revived interest in the possibility of Price Brothers taking over the Saguenay properties.

Canadian Newsprint in South American Market

A new market is opening up for the newsprint mills of Canada in South America, chiefly in the Argentine Republic and in Uruguay. It is learned that companies such as Laurentide, Price Brothers, and Brompton, operated through the sales agency of the Canadian Export Paper Company, are now shipping substantial quantities to these two countries. Up until recently Germany held that market, but various causes, including increased freight rates, have interfered, and these countries are now turning to the Canadian mills.

During the war, when German exports were cut off, there were shipments made for some time by Canadian mills to South America, but when conditions became normal again in Germany these ceased. It is expected that a permanent market will be maintained for Canadian newsprint mills in South America.

Fine Accident Record in Ontario Mills

The awards have been made in the competition annually conducted by the Ontario Pulp and Paper Makers' Safety Association in the matter of accident prevention. The prize, consisting of a silver-mounted shield and a Canadian silk flag, was won in Class "A" by Spanish River Pulp and Paper Mills, Sault Ste. Marie, with a record of 68 non-fatal accidents involving lost time of 846.5 days, equal to 1.28 days per full-time worker. The runner-up in the contest was the Spruce Falls Company, of Kapuskasing, with a record of 66 non-fatal accidents, involving lost time of 582 days, equal to 1.58 days lost time per full-time worker.

In Class "B" the Don Valley Paper Mills, of Toronto, captured the award with a clean record of no lost time accidents. The runner-up was the Bronson Company, Ottawa, with five non-fatal accidents involving lost time of 30 days, equal to 0.636 day lost time per full-time worker.

John F. Carroll, who until recently was superintendent of the Oswegatchie Paper Co., Natural Dam, N. Y., has recently been appointed superintendent of the new paper mill which the E. B. Eddy Co., of Hull, Que., is erecting.

Projected Paper Mill in B. C.

A dispatch from Nelson, B. C., says that a development embracing the conversion of Lardeau and Duncan and Kootenay lake timber into lumber, pulp and paper, and settlement of the Lardeau country with an industrial population depending on the mills, and with agricultural communities resulting from migration of colonists from Zion City, Ill., the scheme depending on the Canadian Pacific Railway forming a development company to carry on the industries proposed, has been outlined by Charles F. Caldwell, general overseer of the Christian Catholic Apostolic Church in Zion, and Kootenay mining man.

Mr. Caldwell is approaching the British Columbia government on the matter, and is to approach President E. W. Beatty of the Canadian Pacific Railway, on a coming visit east.

Brigadier-General J. B. White was elected president of the Quebec Forest Protective Association at the annual meeting recently held in the Mount Royal Hotel, Montreal. George

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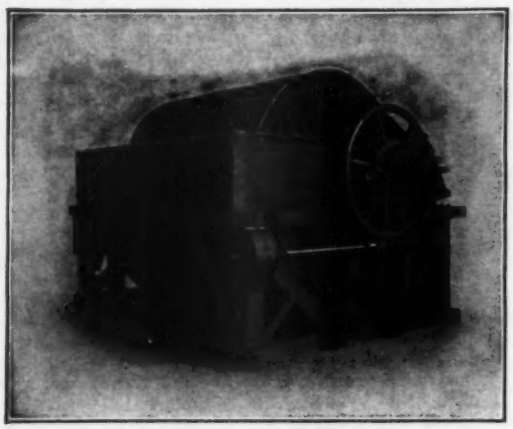

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Chahoon, Jr., was chosen first vice-president, and Dan McLachlin second vice-president. The Governing Council now includes Brigadier-General White, G. Chahoon, Major J. H. Price, J. Bothwell, W. R. Brown and F. W. Clarke.

Interesting Talk on Latin America

The Canadian Export Club of Toronto recently enjoyed an interesting address by C. E. French, of the Toronto office of Howard Smith Paper Mills, Ltd., on his recent tour through Latin America. Mr. French spent several months visiting the most important cities and towns of Mexico, Perú, Chile, Colombia, Venezuela, Brazil and the Argentine Republic.

In his address he displayed a thorough grasp of the racial, financial and political conditions in those countries, and he gave a number of interesting side lights on the business standing, terms of credit, shipping facilities, and the general standing of the various foreign competitors in these markets.

Thunder Bay Orders More Machinery

The Thunder Bay Paper Co., of Port Arthur, Ont., have placed an order for a grinder, a wet machine, and hydraulic press with the Port Arthur Shipbuilding Co., at a cost of $15,000, delivery to be made in six weeks. This will increase the groundwood production by 20 tons daily, bringing it up to 160 tons, and will necessitate the use of 10,000 horsepower instead of 9,000, used at present.

The Backus-Brooks pulp and paper industry at Kenora has grown steadily. All the power that could be produced at the eastern outlet of the Lake of the Woods was available when the 100-ton newsprint mill was completed a year ago, but the steadily lowering water level in the lake is causing apprehension. The mill is running steadily at present, and plans are being made for doubling the capacity during the coming year.

Two Noted Figures Pass Away

Lieutenant-Colonel Thomas A. Gibson, vice-president of Spanish River Pulp and Paper Mills, died at his home in Toronto on January 31st, after a brief illness. Though he had been sick for some time, his illness had not been considered serious, and his sudden death came as a great shock to many friends at home and abroad. The funeral, which was of a military character, was attended by many men prominent in civic and military life in Ontario, together with representatives of the paper trade both in Canada and the United States. Among those who attended the funeral were several of the officials of the Spanish River Pulp and Paper Mills, who came from Sault Ste. Marie, Ont., and Dayton, Ohio.

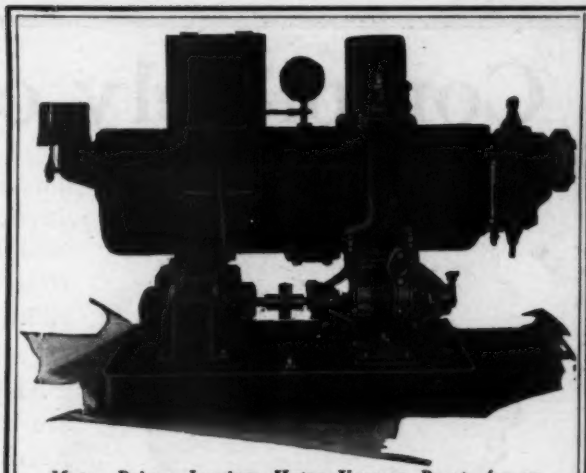
Another prominent member of the industry, Mr. W. T. Miller, died recently at the age of 79. In 1879 Mr. Miller established the concern of Miller Bros., for the manufacture of boards, at Glen Miller, Ont., in association with two brothers. The brothers later withdrew, and Mr. Miller has been in entire control of the business. He was the first to introduce egg-case fillers made of pulp to the Canadian trade, and this has since been a feature of the company's output, although it is but a minor part of the production and is of a seasonal character. The main product of the mill is chip board, vat-lined boards, etc.

U. S. Paper Men May Build Mill at St. Boniface

J. A. Hedgecock and John G. Sutherland, of Dayton, Ohio, recently paid a visit to St. Boniface, Manit., to investigate the possibilities of establishing a pulp and paper mill there. Although they have been interested in this question for more than a year, they have not yet come to any definite conclusion in regard to the matter. Negotiations are understood to be proceeding with the Hydro in connection with a mill in the Elmwood district, the location being a position convenient to the Hydro lines.

They expect to return to Manitoba towards the end of the present month, when they may possibly have a statement to make.

To manufacture pulpwood, pulp, etc., S. McChesney & Son, Ltd., has been organized at Timmins, Ont., and has been



Motor Driven Jennings Hytor Vacuum Pump, for removing condensate and air from paper mill dryers.

For every vacuum need in the mill

Hytor Vacuum pumps are widely used in paper and pulp mills for removing steam condensation and air from dryers, water from suction rolls of all kinds, flat boxes, etc.—in fact, in any place where a vacuum is needed.

No matter how severe the conditions of service, Hytors can always be counted on to give unfailing performance day after day. They are simple in construction as well as in operation, have only one moving part, the impeller, and are entirely free from complicated devices such as valves, cams, gears, pistons, etc. There is nothing to get out of order.

Ask for Bulletin 15

NASH ENGINEERING CO.

So. Norwalk **Connecticut**

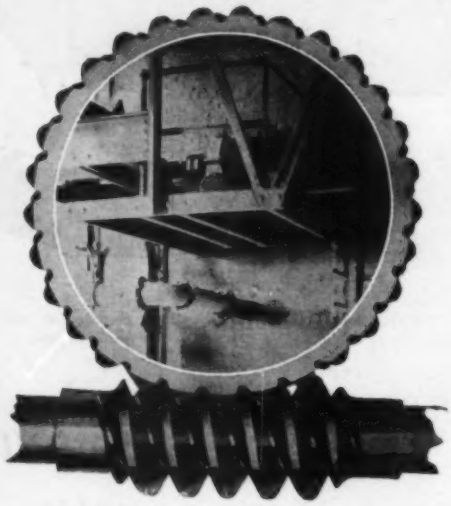
New England Representative: Mr. Gilbert Howe Gleason, Nottingham Building, Copley Sq., Boston.

Western Representative: Mr. Thomas H. Savery, Jr., 1524 Republic Bldg., Chicago.

Jennings Hytor

2027-38

Completely out of the way



The illustration shows a Cleveland Worm Gear Reduction Unit driving a Lime Conveyor in a Paper Mill; motor 1½ H. P., 715 R. P. M.; speed reduction 70 to 1. It is in a location such as this that the constant dependability of a Cleveland is most apparent.

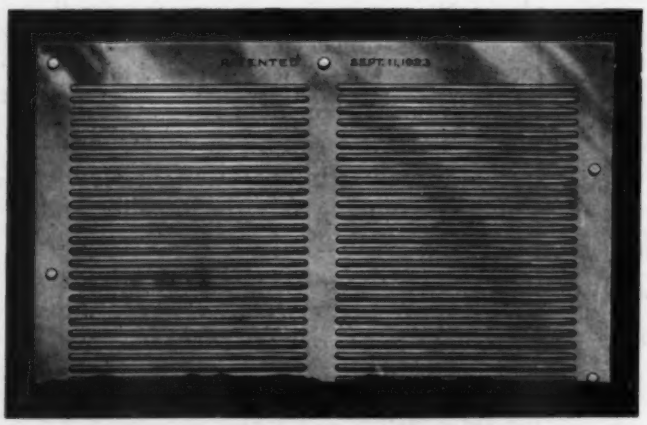
Cleveland Engineers know the requirements of the PAPER INDUSTRY and their recommendations are based on facts accumulated as a result of pioneering experience. This information is available to you upon request.

Cleveland
WORM GEAR
REDUCTION UNITS

The Cleveland Worm & Gear Company

"America's Pioneers in Worm Gearing"

EAST 80th STREET CLEVELAND, OHIO



Fitchburg "New Type" Screen Plates

(PATENTED)

25% greater screening capacity.

Eliminate "plugging-up" and stringing.

Cleanest screening you have ever known.

Fit all types of flat screens.

Performance & Wear Guaranteed

MAY WE SEND YOU A TRIAL ORDER ON APPROVAL?

FITCHBURG SCREEN PLATE COMPANY

FITCHBURG, MASS.

granted an Ontario charter. The authorized capital is $100,000, and the provisional directors are Samuel McChesney, M. E. McChesney and K. MacNabb.

Paper Imports, Ltd., Montreal, have been granted a Dominion charter with power to carry on the business of importers and manufacturers of paper. The authorized capital of the company is $50,000.

Acting in accordance with the provisions of the Quebec statutes, Price Brothers & Co. have notified the Minister of Lands and Forests that they intend to build a dam on that part of the River Saguenay known as the Petite Décharge, in the village of St. Joseph d'Alma, where they are beginning to build a 400-ton newsprint mill. A plan of the territory to be affected by the backing of the water has been deposited with the Department of Lands and Forests.

It is reported in the daily press that attempts are being made by certain newsprint producers to hold up the price of paper to its present level until certain merger negotiations now pending are completed. A close follower of the situation said that the only way in which this can be brought about is by a mutual curtailing of production. He added that the Ontario mills have been fairly well lined up, and everything depends on whether the new Quebec production can be forced into line.

International Fibreboard Busy

The plant of the International Fireboard Co., at Midland, Ont., which was put into operation at the beginning of 1924, is very busy at the present time and is turning out 50,000 square feet of Ten Test Solid Fireboard a day. At the head of the organization is H. J. Wiser, of Prescott, Ont., who states that work will soon start on another plant twice the size in the province of Quebec, and that two will be put up by the company in the United States. The present plant will cost over $500,000.

The company began business a few years ago in Penetanguishene, but its plant was burned down there, and was removed to Midland, a new company taking hold of the proposition and making a success of the enterprise, which is now one of the most thriving industries in Ontario. The prospects for the coming season are regarded as bright.

The sulphite mill of the Mattagami Pulp and Paper Co., which is located at Smooth Rock Falls, Ont., has been operating very successfully under receivership and is experiencing no difficulty at present in disposing of the full production. It is hoped that the receivership can be terminated in the course of the next few months, and in the meantime negotiations are going on with a view to reorganizing the company.

The paper box plant of the Bear River Pulp and Paper Co., at St. Johns, N. B., has not yet been reopened, but indications are that it will resume operations very shortly. For several years the plant was one of the largest box and carton, as well as fiber ware and corrugated paper mills, in Eastern Canada. Until three years ago the box plant was directed by Clarke Bros., Ltd.

Fred L. Ratcliff, head of the Ratcliff Paper Co., Ltd., Toronto, at the annual meeting of the Toronto Board of Trade was elected a member of the committee representing the board on the Canadian National Exhibition directorate.

Ontario to Extend Aerial Forest Patrol

The airplane patrol of the northern forests has proved so successful that the Ontario Government is contemplating an increase in the number of machines, as well as an addition to the strength of the force, according to Hon. James Lyons minister of lands and forests. The new machines will be faster and lighter than the ones now in use. "We find that with the faster machines we can do twice as much work," said Mr. Lyons in a recent interview.

It is the intention to buy four or five of these new machines, which are claimed to be the fastest in existence, and efforts are being made to secure the required number of machines.

Are your Power costs as Low as you Think they Should be?

Of course there is no such thing as the "best" power transmission layout—conditions vary in every shop. *But there is one layout which, in your shop, means the lowest power cost per unit produced*—and that's the one you want.

Let us send you this up-to-the-minute book, "Stopping the Leaks in Power Transmission and Utilization," by Terrell Croft, Directing Engineer of the Terrell Croft Engineering Company, of St. Louis. It compares, simply and directly, the individual motor and the group drive and shows where each may be used to the best advantage. It explains in detail how any plant can easily and at little expense, test out its present power transmission and catch every avoidable leak—leaks that very often lead to tremendous losses.

Edition limited to engineers and educational institutions

The Leather Belting Exchange is a service organization. Its sole function is to help power users toward the most economical, efficient and satisfactory distribution and utilization of power. Mr. Croft's book represents a signal step in this direction. Accurate, simple, authoritative, it may point you the way to substantial savings in your power costs.

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Philadelphia, Pa.

Nothing takes the place of
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Please send me a free copy of Mr. Terrell Croft's book "Stopping the Leaks in Power Transmission and Utilization."

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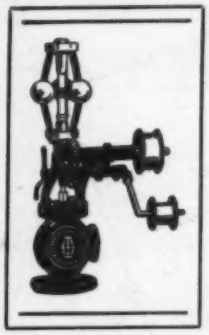

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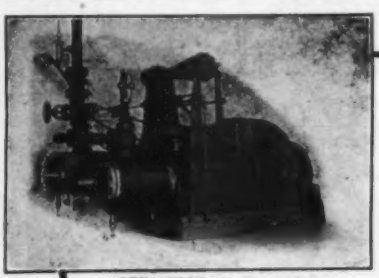

That Cloud of Steam Escaping Through Your Roof Is DOLLARS LOST!

It Costs NOTHING to Find Out How Much a

PROSSER Variable Speed Engine

WILL SAVE YOU

NOTE—
Speed variations can be controlled electrically from anywhere in the mill.

Write to **CHANDLER & TAYLOR CO.**
INDIANAPOLIS, INDIANA

Protect Yourself—DEMAND
ALBANY GREASE
The 100% Lubricant Never Drips

Trade Mark

Improves the operation of your machinery and lessens the wear. Use Albany Grease on your shafting, conveyors, grinders, etc.

Look for the Albany Grease Trade Mark on every can and barrel you buy. Samples on request.

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ADAM COOK'S SONS, Inc.
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NEW YORK

Increasing Efficiency and Reducing Costs with Mechanical Handling Equipment

There is hardly an industry today that cannot profitably employ mechanical elevating and conveying equipment for handling raw or finished products. Pushing the product from place to place with hand labor doesn't pay. It lowers the plant efficiency and keeps production costs relatively high.

Webster mechanical equipment for handling raw and finished products is the result of many years of development and experience. Today, Webster elevators and conveyors are serving profitably in many of our industries. In some of them production is wholly dependent upon the conveying system.

Webster engineers will be glad to confer with you on your handling problems and advise on suitable equipment.

THE WEBSTER MFG. COMPANY
4500-4560 Cortland Street
Chicago, Illinois

All the machines this year will be equipped with wireless. Considerable time was lost last year because the machines could not get into immediate communication with the ground forces when they had something to report.

Fox River Company to Build Mill in Canada

The Fox River Paper Co., who have a paper mill at Fox River, Wis., will build a groundwood mill costing $500,000 on the Kagawong river, Manitoulin Island, Ont., which will be equipped with three grinders and have an output of twenty tons of pulp per 24 hours. Work is to be started shortly on the new structure.

McLarty Bros. and E. Charters, of Sault Ste. Marie, Ont., have been awarded a large part of the contract for the new structure.

New Officers of Garden City Paper Mills

At the annual meeting of the Garden City Paper Mills Co., Ltd., of St. Catharines, Ont., Charles V. Styrett, formerly secretary-treasurer of the company, was elected president to succeed the late L. H. Gardner, and Leo E. Charles of Toronto was elected secretary-treasurer. Mr. Styrett was also elected president of the Canadian Vegetable Parchment Co., Ltd., at the annual meeting of that organization.

The annual reports presented indicated that the company had had a fair business year, and confidence was expressed as to the future.

The British American Wax Paper Co., which for some years have operated in the Wrigley Building, Carlaw avenue, Toronto, have moved their plant to Hamilton, Ont., where they have been consolidated with the plant of the Dominion Sales Book Co., on Burlington road. The head of the company is L. M. Appleford.

A fire that broke out in a two-story building belonging to Morris Horenfelt, Toronto, wrought about $5,000 damage to the rag and paper stock stored in the building.

At the fifth annual meeting of the Allen Paper Co., Ltd., Toronto, satisfactory reports were presented dealing with the year's business. C. E. Allen was elected president, and H. G. French secretary-treasurer.

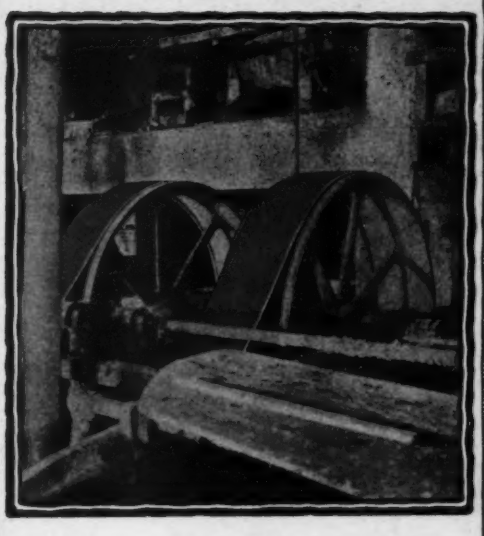
Gordon McLarty, superintendent of Booth's board mill, at Ottawa, has severed his connection with the company, and his place has been taken by Mr. Waddell, who has been employed by the Booth company for some time. The former superintendent is a son of the late Dan McLarty, who was for many years superintendent of the board mill of the company.

Aftermath of War Time Control of Newsprint Prices

A writ was recently issued at Toronto by the E. B. Eddy Co., Ltd., against the following companies: Spanish River Pulp and Paper Mills, Ontario Paper Co., Abitibi Power and Paper Co., J. R. Booth, Ltd., St. Maurice Paper, Brompton Pulp and Paper, and Donnaconna Paper Co.

The plaintiff claims payment of the difference between the value and the Canadian fixed price for all newsprint supplied to Canadian newspaper publishers in excess of the plaintiff's proper proportion during 1918 and 1919, while the distribution and price of newsprint were under government control, and for payment of differentials owing by the defendants or any of them, for paper supplied during the said period.

The Supreme Court of Nova Scotia has under consideration a motion to set aside an award of $23,650 to Thelbert Rice, of Bear River, because of damage sustained when the Bear River Pulp Company took water estimated at 1,500,000 gallons from the east branch of the Bear River, piping it into the mill. The board of arbitration appointed to adjust the dispute decided on $23,650. Mr. Rice contends this sum is insufficient and charges two of the members of the board with judicial misconduct. They are F. W. W. Doane, of Halifax, and W. T. Robinson, of Guysboro.



Firm-gripping *leather* belts for beater drives

THE heavy work of driving beaters requires the strength that is found only in the finest leather.

You'll find such superstrength leather belts in the Standardized Series —*and they are guaranteed water-proof!* Won't separate at laps or plies. Will even run under water without damage! They give long-time, satisfactory service on beaters or any other paper mill drive.

The right belt for the right job, all through the mill. That's the idea behind grouping brands of Graton & Knight Leather Belts into the Standardized Series.

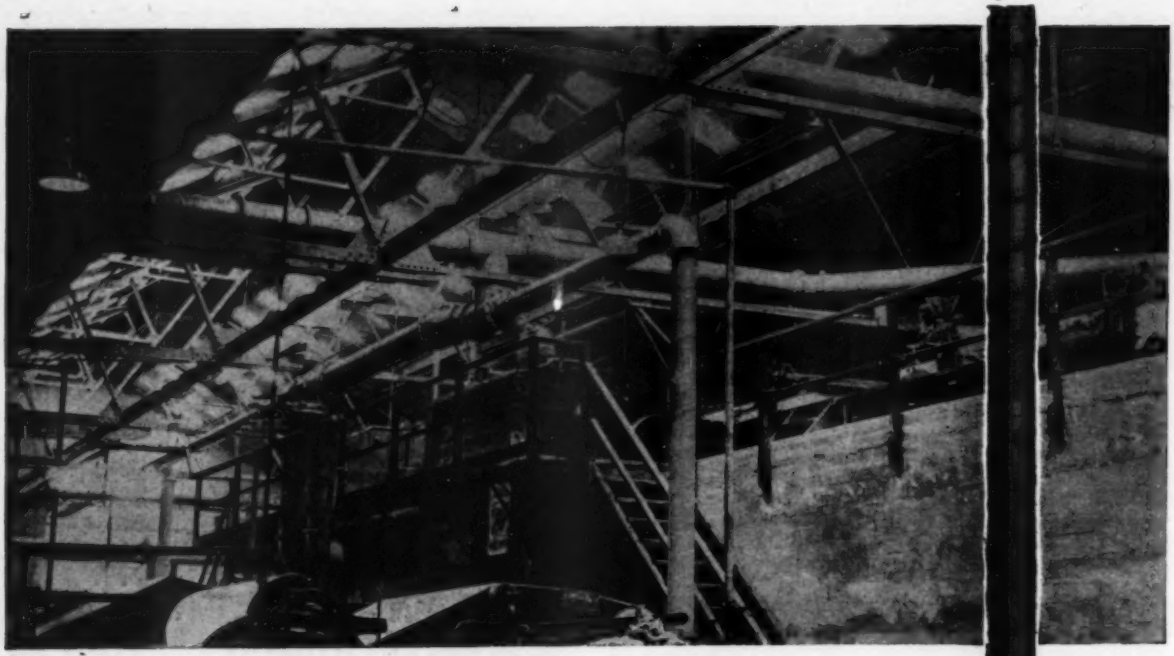
Each brand carefully *standardized.* All Graton & Knight Belts are held to rigid requirements of quality. Made to give you a new understanding of belting economy and service.

Write for book 101-S, which tells the value of Standardized Leather Belting in paper mills.

THE GRATON & KNIGHT MFG. CO.
Tanners—Makers of Belts and Other Leather Products
Worcester, Mass.

GRATON & KNIGHT
Standardized
LEATHER BELTING
Nothing takes the place of Leather

GRATON & KNIGHT



Ten inch and twelve inch Taylor Spiral Riveted Pipe (asphalted) installed by Marathon Paper Mills Co., Rothschild, Wis.

Proof that pipe can be strong without being heavy—

AN UNUSUALLY large number of prominent paper mills have standardized on Taylor Spiral Riveted Pipe because they have found it fulfills their piping requirements more satisfactorily than any other form or make of pipe.

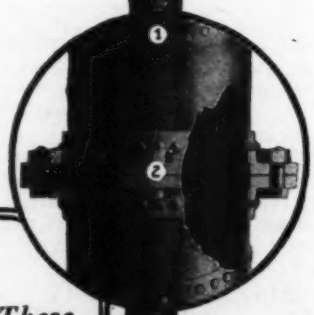
In Taylor Spiral Riveted Pipe they have found a pipe equal to pressure demands, but light in weight and therefore easily handled in spite of its exceptional strength. In other words, they have discovered that the strength of the spiral riveted seam is *added* to the *full strength* of the metal, making Taylor Spiral Riveted Pipe the strongest pipe of its weight.

Another outstanding feature that has made this pipe dominant in the paper industry is its absolute uniformity—every length is hydraulically tested to 50 per cent in excess of specified pressure. Moreover, every length is fitted with Taylor Forged Steel Flanges — described opposite.

Of almost equal importance is the superior protection. Spiral Riveted Pipe is galvanized by immersion, *after completion*, in pure molten zinc, or heavily coated by immersion in pure natural asphalt, depending on specifications. It is also manufactured of copper bearing steel when desired.

Taylor Spiral Riveted Pipe is made in all sizes from 3 to 42 inches diameter. Galvanized pipe in lengths to 20 feet; asphalted pipe in lengths to 40 feet. Special fittings of every description.

Ask for 88-page Production Book describing Taylor products: Forge Welded Pipe, and a wide variety of forged specialties.



Note These Advantages

(1) The riveted spiral seam for greater strength and stiffness without increased weight. Riveting is by compression under enormous pressure—not by hammering.

(2) The forged steel flange — practically unbreakable. It can be more securely riveted to the pipe, eliminating leakage. It cannot be harmed in shipment, during installation, or in service. Bolted joints, permitting slight deflection, are also furnished.

Ask for this FREE book

American Spiral Pipe Works
Main Office and Works: Box 485, Chicago, Ill.
New York Office: 50 Church St.

TAYLOR *Spiral Riveted* PIPE

PIS-I-RTG

Michigan News

March 2, 1925.

Superintendent's Board Division Meet at Monroe

The Western Board Division of the American Pulp and Paper Mill Superintendents' Association opened their convention with registration at the stroke of nine in the lobby of the Park Hotel, Monroe, Mich., on February 20. Mr. Henry Bert, superintendent of the Monroe Paper Products Co., acted as general chairman for the occasion in the absence of Mr. Robert Eminger, who was a little late in arriving. The registration was in charge of Alex Duncan of the Western Paper Makers' Chemical Co., of Kalamazoo.

Visit to Monroe Paper Products Co.—After all those present had registered, Mr. Bert conducted the group first to the Monroe Paper Products Co. This concern operates one 6 cylinder machine. They have one continuous beater made by the Dilt Machine Company. With this one continuous beater, they also operate 6 regular beaters. The machine is a Beloit 114-inch trim. When the party was in the plant, this machine was running 85 test .016 liner, and running the sheet direct to the winder, and winding in one roll, the full width of the machine. These rolls were taken direct from the machine with an electric hoist, and placed in their roll room, where they were easily accessible to their paste machine. On the paste machine they were running three rolls, pasting them with silicate, cutting them into sheets on the machine, and taken into their carton plant to be manufactured into cartons.

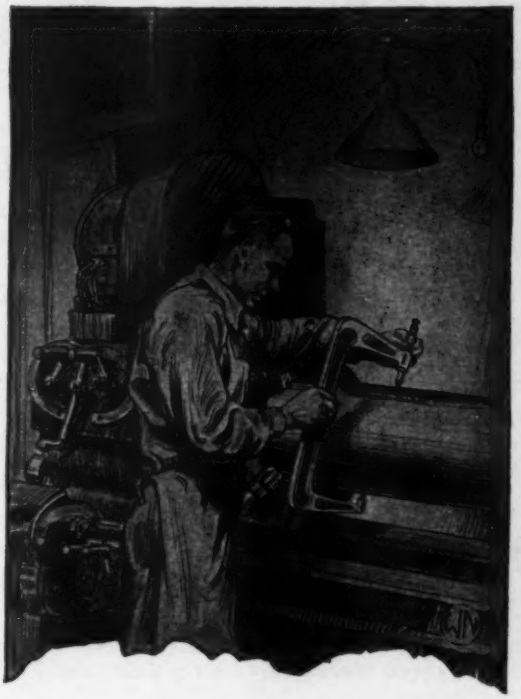
Monroe Paper Co.—Mr. Bert led the group from here to the Monroe Paper Co. This is the smallest mill in the district, operating only one machine, with a 48-inch trim. In their beater room, they have two 800-pound beaters. This mill was started in 1876 to manufacture plain chip with 100 per cent old papers, and is still operating on this. The machine and beaters are practically in the same room, and there was hardly room enough for the entire party in the mill at the same time. This mill has been operating steadily, showing that all the money is not made in the giant plants in this district.

The party next looked over the B. & R. Division of the Consolidated Paper Co. In this division there are four machines; one 80, one 114 and two 124 cylinders. It operates its own box factory.

Dinner was the next thing the party was in need of. So, heading back to the hotel, the party was increased by Jacob Parent, Western Board and Paper Co., Kalamazoo, William Seivert, Michigan Carton Co., Battle Creek, and Harry Urich, of the MacSimBar Paper Co., at Otsego. Owing to some delay, these members did not arrive in time to make the morning trip through the mills. After the dinner was settled, the party followed Mr. Bert to the River Raisin Paper Co.

Visit to River Raisin.—This plant operates four machines; one 94-inch, one 112-inch, one 124-inch and one 102-inch. The 102-inch machine is in their strawboard mills. In this plant, they make paper from straw. The straw comes into the mill in bales, tons of which is piled up outside the mill. The straw is cooked in Biggs egg shaped rotaries of which they have eight, and then dumped into a giant pit. The stock is carried from this pit by means of an endless chain, into the beaters. This stock is furnished up with the waste from the mill and a bale or so of corrugated stock to the beater. This comes over the machine as a base for corrugating stock. This stock is corrugated in their own box factory, and made into boxes, and shipped out knocked down, printed and ready to fill.

The River Raisin also operates its own silicate plant, where it makes all the silicate used in its box factory. Here sand and soda ash is weighed out, and put into a giant hopper and sent to blast furnaces. They get about four cooks out of a blast furnace in twenty-four hours, and this is put in a giant rotary that is revolving about four times as fast as the ordinary rotary travels. This is turned by an electric motor, but a gasoline motor is already to hook up in case the electric motor fails. This is for the purpose of keeping this silicate revolving. If this should remain stationary for half or three quarters of an hour, the cook would have to be chiseled out. When this process is completed, it is drained off into tank



PRECISION PAYS

The winding drums on CAMACHINE Roll-winders are machined with a tolerance of only one-thousandth of an inch variation from the standard. This is accuracy — accuracy which can be measured directly in terms of dollars and cents by the users of Cameron Machines, because accurately wound rolls of paper and board can be produced without coddling or fuss.

The rolls separate cleanly, easily and surely. They are good rolls, because they are made in the right way.

Mill men everywhere are getting to know CAMACHINES and what these good roll-winders will save them in roll production. Do you want to be shown? Drop us a line.

Cameron Machine Company
61 Poplar St., Brooklyn, N. Y.
[Builders of CAMACHINES]

THE WATERBURY FELT CO.
SKANEATELES FALLS
New York

FELTS and JACKETS

Top and Bottom Wet Felts for board machines, with all the qualities requisite to insure long life and continuous production.

They Satisfy

Pickles' Patent Automatic Steam Regulator
FOR
Paper Making Machines

Which absolutely control the drying of the sheet. Installed on sixty days' trial

W. F. PICKLES **Buckland, Conn.**

Fitchburg Duck Mills
ESTABLISHED 1844
54 Duck Mill Road
FITCHBURG, MASS.
MANUFACTURERS OF
STANDARD AND MULTIPLE PLY
DRYER FELTS
English Weave in Two, Three, Four, Five and Six Ply—60 Inches to 176 Inches in Width
Fine Faced Felts for Fine Papers. Absolutely no felt marks in paper. TRIUNE Three Ply Felts for Coarse Papers.

LOCKPORT Felts
EXCLUSIVE MAKERS OF
Paper Makers' Felts

Have You Run Them?
If Not, Why Not?

Are You Interested in Accurate Running Felts?

Give Us a Trial
Get Authentic Information
Ask the Men Who Run Them

Yours for service
LOCKPORT FELT CO., Newfane, N. Y.

"Tannite" Deckle Straps for Fourdrinier Paper Machines

Represent the latest improvements. They are made to lie flat on the wire and run straight

STOWE & WOODWARD COMPANY
The Rubber Roll Makers NEWTON UPPER FALLS, MASS., U. S. A.

cars and is ready to be shipped to their box factory across the way. They produce about 150,000 pounds of silicate here in twenty-four hours.

Consolidated Paper Co.—The next place visited was the main plant of the Consolidated Paper Company. In this division was a cylinder machine with five dryers in a deck, and 9 batteries of these set this way to conserve floor space. While the party was in the mill, the machine did not have a break, so the party did not see the crew rethread the machine.

Monroe Board and Liner Co.—The next mill open to our inspection was the Monroe Board and Liner Co., formerly the Ligistra Fibre Co., of Barberton, O. J. D. Miller, the manager and treasurer of the company, showed us through the plant, which has been only running since the first of the year, and is in the old glass company's plant. This company does not manufacture paper, but has found a new use for board. It manufactures automobile panels, out of a special board. These panels are used in the inside of the doors on all Ford open models, and extend back to the engine partition. Mr. Miller told us that we could laugh at the Ford for using paper panels, but not to examine the higher priced cars too closely, or we would find the same materials in their panels. This board comes into the plant in rolls, and is pasted together, making one sheet out of three, then it is cut, plated, and dipped two or three times, to give the necessary finish, and dried. Then the slots are stamped in, making the panels already to be put on to the cars before they go out of the plant. Mr. Miller gave us an example of the method used by the Ford Motor Car Co. They telephoned an order in Thursday, confirmed the same Friday, and Monday morning the cars were going out with the Monroe Board and Liner Company's paper panels on them. This plant is working night and day on the panel business, besides manufacturing parchment lined board, M. F. lined board, litho lined board and brushed lined board. They will match practically any leather finish with their grained board.

Mr. Miller was saying that they use waterproof paste exclusively on their products. This paste can be soaked in water for three hundred hours, and will show no signs of letting loose at the end of this time. This company was the first to turn out successfully high gloss panels for motor cars. They also manufacture the leather edge coated edge suitcase and general specialties of this coated board variety. Frank Kress, formerly of the Kalamazoo Paper Co., Kalamazoo, Mich., is general superintendent of their plant.

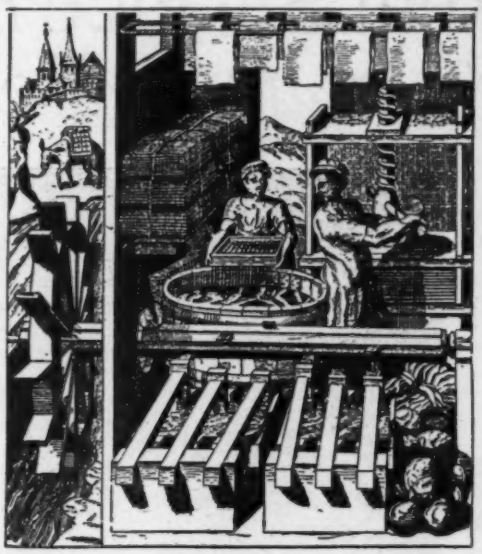
Banquet and Formal Addresses.—Returning to the hotel, the banquet was put on promptly at seven o'clock. After the banquet, Henry Bert and L. F. Murphy took charge of the meeting. Mr. Eminger was the first speaker, and he told of the purpose of the association, and invited all those present to come to Buffalo for the annual convention. He said the following in part:

Secretary Robert Eminger's Remarks.—"The day of not exchanging ideas among you is past. The executive or superintendent who does not desire to do this is not going to advance with the times. Today we have what might be termed the parent association, the American Paper and Pulp Association, which is made up of the officers and executives of practically every pulp and paper industry in the United States, and with which our association is affiliated. To this there has been added the Technical, the Cost, the Salesmen's Associations and other similar bodies, all working in harmony and in the interest of the pulp and paper industry, not only in the States but in Canada as well.

"The superintendent of today is expected to produce as large a tonnage as his equipment is built for. He therefore must be a worker, he must be a producer, and in order to do this he must be on the alert at all times to keep himself informed as to the new developments, new methods and new ideas. He is not only expected to produce the products of his mill, he must also produce men to take up the work of making the products, in order that there will be men trained in the art of paper making, to man the new machines that many of the mills are constantly adding.

"How is he going to do this without the benefits derived from a membership in the Superintendents' Association, or any of the others I mentioned?

"Exchanging ideas with his fellow members is one of the



Baskerville's Wove Paper!

IN 1750, Baskerville, a printer of England, published his famous edition of the Poems of Virgil, using the first paper ever made on woven wire. The name "wove" was applied to this paper due to the fact that the wire left a slight impression of its woven texture in the paper.

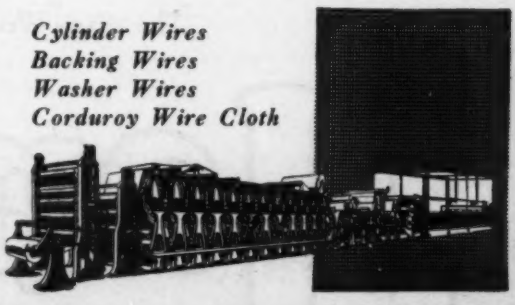
Since then, the methods of Baskerville have been steadily improved upon. Paper production is now measured in millions of tons per year—but the woven wire is still the foundation of its manufacture.

The experience of more than half a century of wire weaving stands behind Tyler Fourdrinier Wires. The weavers are men who have devoted their lives to the art—*they have made these wires a standard.*

The Tyler standard of quality assures the paper maker wires that run straight and true—that give continuous service—that produce the maximum tonnage and profit from his plant.

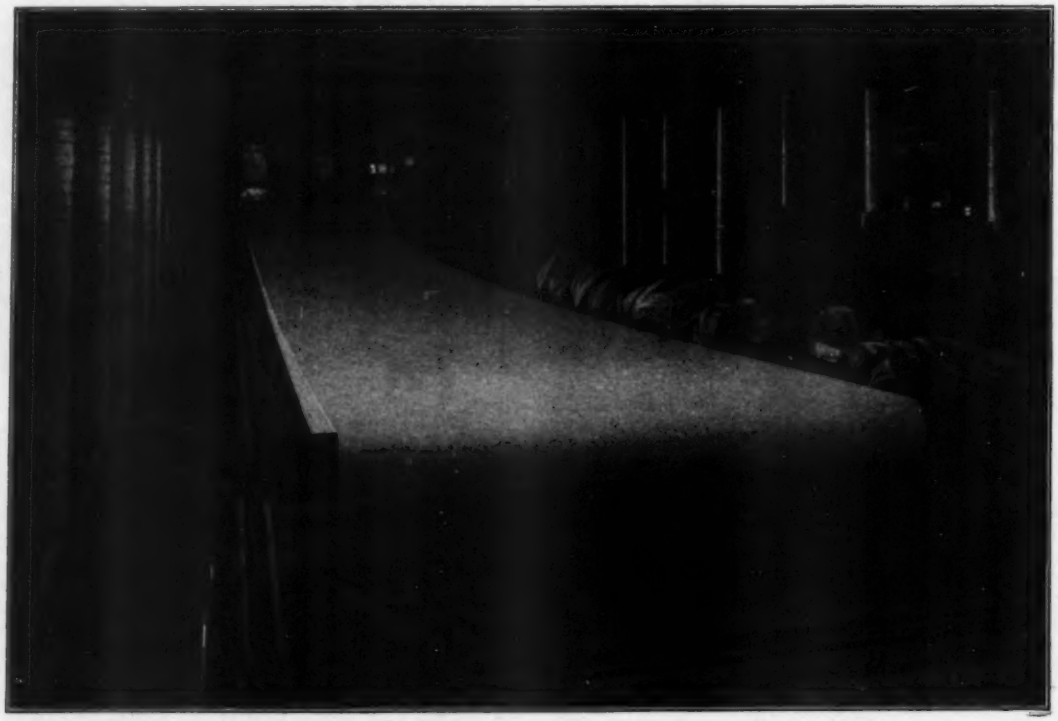
THE W. S. TYLER COMPANY
Cleveland, Ohio

Cylinder Wires
Backing Wires
Washer Wires
Corduroy Wire Cloth



Tyler Fourdrinier Wires

Real Service From the Hamilton Felt Men



You will recognize Hamilton felts by two blue lines running the full width of the felt with one shorter blue line between them.

THE Hamilton Service Men who help you find your felt troubles and remedy them are practical paper makers of the first rank.

They served as superintendents in charge of paper making in some of the best mills in the country before they began to sell and service Hamilton felts.

They have hunted trouble in hundreds of mills of all kinds. They know nearly everything that can go wrong with a paper machine.

Whatever the difficulty they can straighten it out and get the felt running so that it will give the satisfaction it was made to give.

These men are at your call whether you use Hamilton Felts or not. Don't hesitate to write or wire for them.

SHULER & BENNINGHOFEN **Hamilton, Ohio**
The Miami Woolen Mills **Founded 1858**

Hamilton *Felts*

best assets he has, he learns of new methods, new developments, and he therefore has something to make his mill produce better paper or pulp, and increase the output at the same time.

"The Superintendents' Association has accomplished a great deal of good by these meetings, by honest co-operation, not only with this association but with all the others that are working in harmony. We need the technical man, the cost man and the salesman, and they need us. Therefore we should strive to always be open minded, ready to help each other with the difficult problems that arise in the work of your fellow members."

Two other speakers took the floor, A. E. Montgomery, of the J. O. Ross Engineering Co., New York City, gave a very interesting talk on "Ventilation of the Mill Throughout and How to Get the Best Results from Drying in Connection with Ventilation." This was interesting as well as entertaining. The other speaker was W. H. Scott of the Duriron Company, of Dayton, Ohio. He spoke on "Using Dissolved Alum in the Beaters."

After the discussion had subsided, Mr. Robert Eminger, the national secretary for the Superintendents' Association, asked if any problem was bothering the executives present. One asked the cause of fuzz on board, and a lively discussion followed. The inquirer was much pleased with the interest shown, and was ready to go back to his plant to try out several new angles in the case which he had overlooked in trying to get rid of this nuisance.

Election of Officers.—Saturday morning, the election of officers for this division was held. Henry L. Bert, superintendent of the Monroe Paper Products Co., was named president; Harry Urich, MacSimBar Paper Co. was named vice-president, and William Seivert, Michigan Carton Co., Battle Creek, Mich., was named secretary-treasurer.

Sale of Eddie Paper Stock Ruled Legal

The legality of the sale of the assets of the Eddy Paper Company of Michigan to the Eddy Paper Corporation of Illinois was sustained by a decision handed down Saturday by Judge Clayton S. Johnson of the Brank-St. Joseph circuit. It is a complete victory for the officers and directors of the Michigan company and a defeat for the preferred stockholders who tried to have the division of assets set aside.

The case is one that has attracted widespread interest throughout this section of Michigan, where between 1,400 and 1,500 people held common and preferred stock. These stockholders included people in all classes of industry, a great many of them being wage earners.

Judge Johnson sustained the sale as recommended by a special committee of the stockholders of Eddy Paper Company of Michigan. This was to the effect that the Eddy Paper Corporation of Illinois with an authorized capital of 125,000 shares of no par common stock, should take over the assets of the Eddy Paper Co., pay all indebtedness, assume any outstanding bond issues of the Michigan corporation, and give the stockholders 31,250 shares of the no par stock of the new corporation from the original stock in the Michigan company, consisting of 700,000 shares of common stock and 290,000 shares of preferred stock. In recommending the sale, the special committee placed the preferred stock on the basis of 3 to 1 for the common stock in the division of the stock of the Illinois corporation.

This division as reported by the committee was supported by the stockholders of the company at an adjourned meeting held in the offices of the Kalamazoo-City Savings Bank.

Certain preferred stock immediately contested this sale, contending that the sale should provide for the payment of all debts of the company and that the 31,250 shares of stock in the Illinois corporation should then go the preferred stockholders to meet their claims. Judge David Anderson and Thomas J. Cavanaugh, both of Paw Paw, filed suit for the preferred stockholders. The officials of the Eddy Paper Co. were represented by Harry C. Howard, of Kalamazoo, while Mrs. Henry Eddy, previous to his death president of the company, was represented by Edward A. Andress, of Three Rivers. As Mrs. Eddy held nearly half a million shares of the common stock in the Michigan company, she asked that the sale recommended by the special committee be authorized.

Progress in Paper Making

WITH progress in American paper making, we are concerned and connected. To commemorate the advances that have been made, the more important annals of the industry will be recalled from month to month in this space.

The First American Paper Machine

Thomas Gilpin, of Wilmington, Del., took out a patent for a cylinder paper machine in 1816 which was put into operation in his mill the following year. Though preceded by the Fourdrinier machine invented by Louis Robert and the English cylinder machine of John Dickinson, Gilpin's was nevertheless the first to be erected and run in America. It is estimated that there are about 700 cylinder machines in the United States. The moulds and wire covering for many of these were made by the Cheney Bigelow Wire Works.

Established 1842

Cheney Bigelow Wire Works

Experienced and Progressive

Fourdrinier and Cylinder Wires
Dandy Rolls and Cylinder Moulds
made and recovered

SPRINGFIELD, MASSACHUSETTS

MAGIC BOILER PRESERVATIVE

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Positively removes and prevents scale, stops minor leaks, pitting and corrosion

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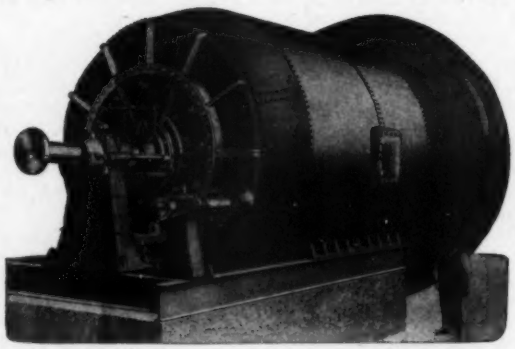

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efficient durable economical

an ideal belting for paper mill drives

—our series of "Quality Facts about Belting" tells you why
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Thoroughly Waterproofed and Built for Service

Chas. A. Schieren Company
ESTABLISHED 1848

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Belt Manufacturers

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Branches and Distributors in All Leading Cities

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The Texas Chas. A. Schieren Co., Dallas, Tex.

Send for catalogue

At the time the suit was instituted early in 1923 Mrs. Eddy was employed in the office of the concern, having no other means of support.

The case was heard in Paw Paw early in 1923. In the meantime, the Eddy Paper Corporation had taken possession of the plants of the Eddy Paper Company and has been operating them for over two years with a fair degree of success.

The Eddy Paper Company's rise was one of the most spectacular incidents in the history of the paper industry in Michigan. It was at the outset a very successful proposition and looked like a veritable gold mine for the stockholders. Stock dividends were almost an annual event. In 1918 the concern, operating a small mill at Three Rivers, took over the mill of the defunct Oscar Felt and Paper Company at White Pigeon. Two years later the company authorized the erection of the first unit of what promised to be the largest board mill in America. It was to have four immense cylinder machines and be the latest thing in board mills. With the decision to erect the plant, the capital of the concern was placed at $7,000,000 common stock and $5,000,000 preferred stock, the latter paying 7 per cent per annum. The sale of the preferred was very heavy throughout this section of Michigan. Then came the slump in the board market. The death of the late Frank H. Milham was a severe blow. The late Oscar Gumbinsky succeeded him and internal dissensions arose. Mr. Gumbinsky and Charles E. Nelson, manager, had trouble and the latter resigned. Mr. Gumbinsky was succeeded by Charles A. Blaney. At last the directors recommended the sale to the Eddy Paper Corporation of Illinois. It was not until the decision just handed down by Judge Johnson that the sale was pronounced legal.

Promotions in Allied Mills

Owing to the resignations of Jacob Kuss, general superintendent of the Allied Paper Mill's coating divisions, and Frank Johnson, general superintendent of the King division, George H. Pountain, general superintendent of the Monarch division, has been promoted to the position of general superintendent of the King division, and Martin Mulder, superintendent of the Monarch coating division, will handle both the Monarch and King coating divisions. M. C. Mulder, color man at the Monarch coating division has also been transferred to the King coating division.

William Carroll, superintendent of the Bardeen book division at Otsego, has been promoted to general superintendent of the Monarch division. Jack Spoor, assistant superintendent at the Monarch, has been made assistant superintendent in the book division of the King. Arthur Randall, boss machine tender at the Bardeen division, has been promoted to superintendent of that division.

This is still in harmony with the Allied policy of developing their own executives, and of hiring as few men outside their organization as possible for their positions of responsibility.

Allied Paper Mills Capitalized at $9,000,000

The capital stock structure of the Allied Paper Mills, according to the last statement filed with the secretary of state, shows an authorized capital of $9,000,000. Of that amount $5,000,000 is represented in 500,000 shares of preferred stock and $4,000,000 in common stock, in 400,000 shares.

The old stock of no par value common is being converted into $10 par stock as fast as it can be turned in. George S. Davis, secretary of the company, is very busy getting these certificates out.

Pulp Import by the Great Lakes Method

Kalamazoo valley paper manufacturers in common with other concerns in that line throughout the Middle West, are taking keen interest in a movement sponsored by the Toledo Chamber of Commerce, of Toledo, Ohio, to secure shipments of wood pulp and sulphite from Scandinavia direct to the port of Toledo.

A meeting was held recently in Toledo, at which time Secretary Leonard J. Gans of the foreign trade department of the Toledo Chamber of Commerce brought up the proposi-

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Each CRESCENT PLATE is curved so that the joint hugs the pulley tightly—holds the power. No wear of metal on the pulleys, no noise—a "sweet" running belt is the result. Crescent Belt Fasteners insure continuous production—reduce Belt troubles to a minimum. Write for Belt Joining Booklet. Crescent Belt Fastener Company, 247 Park Avenue, New York.
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Lift Electrically

Why pull, tug, strain and waste your time with slow lifting methods, when the ROEPER TYPE "R" Electric Hoist will do the work twenty times as fast. The price is surprisingly low. Send for Bulletin.

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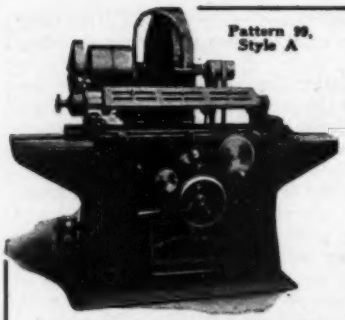

Pattern 99, Style A

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Full automatic, semi-automatic, and hand machines.

Stationary wheel and traveling work or stationary work and traveling wheel.

Belt or motor drive.

Open frame or fully enclosed, completely self-contained, cabinet base machines, for every variety of service.

Send for Catalog Covering New Type Machines

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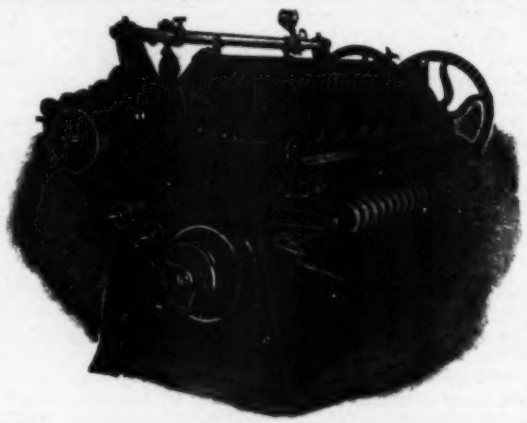

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Single, Duplex, and Diagonal

CUTTER KNIVES
PATENT TOP SLITTERS

Hamblet Machine Co.
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THE JOHNSON FRICTION CLUTCH

For Reverse Drive on Paper Machinery

Double Clutch Exterior

Used on the countershaft, one pulley is mounted on each hub of the Johnson Clutch. Thus, through one open belt and one crossed belt, the operation of a machine may be reversed quickly and easily.

Also, reverse motion may be obtained by installing the clutch between bevel gears on machinery. Spur gears are frequently used to get two speeds on machinery. Equip your paper-making machines with Johnson Clutches. WRITE FOR CATALOG P. I.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

tion, citing his hopes of ultimate success. It was pointed out that paper mills in the Great Lake states require at least 150,000 to 200,000 tons of Scandinavian kraft wood pulp annually and that by shipping by water direct to Toledo, an immense saving in freight would result. The experiment has already been tried successfully by the Consolidated Paper Company, of Monroe, Mich.

There is no denying the fact that the sentiment is rapidly growing for the promotion of all-water shipments from abroad and the use of the St. Lawrence river and the Great Lakes gateway to the Central Western territory. It is shown that concerns like the paper industry requiring immense quantities of heavy tonnage raw material would save by the plan.

Traffic representatives of the Bryant Paper Company, Allied Paper Mills, and Kalamazoo Paper Company have already had the matter up with ocean lake shipping concerns.

Oscar Gumbinsky Dies Suddenly

Oscar Gumbinsky, 39, former president of the Eddy Paper Company, Three Rivers, Mich., and the Daniel Boone Woolen Mills of Chicago, died Tuesday morning, February 17, at the breakfast table in his residence at 4755 Drexel Boulevard, Chicago, Ill. He suffered an attack of apoplexy.

Mr. Gumbinsky was born in Kalamazoo, the son of Mr. and Mrs. Jacob Gumbinsky and resided here until about seven years ago. His father laid the foundations of a substantial fortune in the junk business. His son inherited his native shrewdness and on the death of his father formed the Oscar Gumbinsky Brothers and Company, a concern that handled an enormous tonnage in paper stock and rags.

The Gumbinskys have in recent years been disposing of all their Kalamazoo holdings. The property of Oscar Gumbinsky Brothers and Co. was sold to the Waste Paper Packing Co. which has been absorbed by the Kalamazoo Trading Co. of which Albert Meisterheim is president.

Wolverine Paper Co. in Financial Difficulties

William J. Banyon, referee in bankruptcy for the Western district of Michigan, held a hearing of the bankruptcy case of the Wolverine Paper Co., of Otsego, a corporation alleged bankrupt. The creditors met in the office of the paper concern. Lewis W. Dickinson, secretary, and other officials of the company were also present. The meeting was called to consider and pass upon claims of the creditors and to consider the alleged bankrupt's offer of compensation and for the examination of officers of the bankrupt.

The alleged bankrupt's liabilities show a total of $384,320.71 claims.

Kalamazoo Trading Co. Holds Annual Meeting

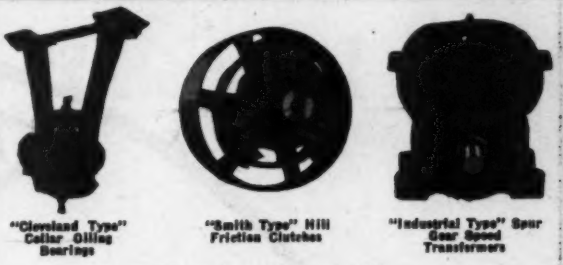
The Kalamazoo Trading Co. enjoyed a satisfactory business during 1924, according to Albert Meisterheim, president and general manager. The prospects for 1925 are better. At the annual meeting of the company Albert Meisterheim, C. A. Fox, Felix Pagenstecher, W. B. Milham, Charles Clarage and Joseph Brown, Kalamazoo, and S. B. Sutphin, Cincinnati, were re-elected directors. The officers were all re-elected. They are: Albert Meisterheim, president; S. B. Sutphin, vice-president; C. A. Fox, secretary-treasurer.

Wightman Added to Directorate

William H. Wightman, general superintendent of the Lee Paper Co., Vicksburg, has been elected a director of the concern to succeed the late Samuel Folz. Norman Bardeen is continued as secretary-treasurer and manager. All other officers were re-elected.

It was reported at the annual meeting that the Lee Paper Co. has retired its preferred stock issue by the sale of 5,000 shares of class "A" stock at $60 a share. This places the present capital at $800,000, all of which is in common stock.

Mr. J. W. Hildebrand, formerly connected with the Jones Foundry & Equipment Co. of Chicago, has recently joined the Sales Force of Foote Bros. Gear & Machine Co. as sales engineer.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"Smith Type" Hill Friction Clutches
"Industrial Type" Spur Gear Speed Transformers

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"Hill Clutch" Mill Equipment

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Agitator Equipment of All Kinds

Your wants mean more to us than "so much material." A careful study is made by Engineering Experts skilled in Power Transmission problems. You receive the accumulated experience of "half a century" serving the Pulp and Paper Mill Industry.

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ACCESSIBILITY!

Don't shut off the power to test a Palmer-Bee Reducer—don't dismantle any part of the drive—simply remove four bolts, lift off the cover and *see the gearing running under full load!*

Nine P-B Features That Save You Trouble and Expense

1 **Ruggedness**—Unique design permitting use of wide-faced, coarse pitch gears.
2 **Accessibility** — Entire mechanism in lower half of housing, with easily removable cover.
3 **Through Shafts** — Supported in bearings at each end. No overhung studs or shafts.
4 **Eliminated**—Diaphragms, floating discs, overhung studs.
5 **Lubrication** — Combined splash and force feed.
6 **Quietness** — Natural result of machine-cut gears running in an oil bath.
7 **Totally Enclosed** in oil-tight dust-proof and accident-proof housing.
8 **Ratios Changed** by substituting one or more pairs of gears.
9 **Inherent Value** — Backed by 20 years of engineering and power transmission experience.

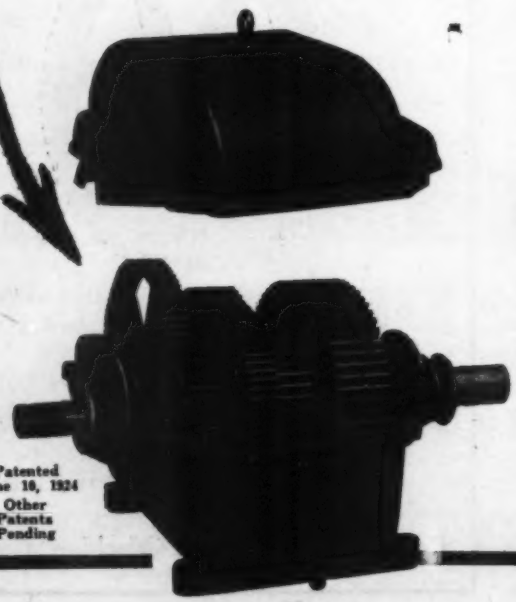
Every engineer appreciates the advantage of this Palmer-Bee construction feature because they realize that ordinary reducers necessitate shutting off the power and removing part of the drive to inspect the gears—and naturally in dismantling the mechanism the cause of the difficulty is often lost.

This is only one of the many features of Palmer-Bee Speed Reducers that save you trouble and expense in the years of satisfactory service that follow their installation.

Speed Reducer Bulletin 445 Should Be in Your Files!

All the knowledge that we have gained in our 20 years' experience as Engineers and Manufacturers in the Power Transmitting Machinery Field is at your disposal.

Our new Speed Reducer Catalog contains a complete list of ratios, horse power capacities and dimensions of our entire line of Spur Gear and Worm Gear Speed Reducers, as well as tables showing the efficiency of the reducer at various speeds of standard motors. Wire or write for a copy NOW!



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Speed Reducers

Conveyors for Every Purpose

Northern New York News

March 2, 1925.

Champion Paper Company Absorbed

Plans to organize the Champion Paper Corporation for the purpose of acquiring the entire business of the Champion Paper Company, of Carthage, have been announced by the Northern New York Securities Corporation which, with the F. L. Carlisle & Company and Schoelkopf, Hutton & Pomeroy, Inc., is offering a new issue of $600,000, first mortgage, six per cent, sinking fund, gold bonds. The corporation will take over the business of the paper company which has been in existence since 1901. The corporation will own the entire capital stock, consisting of 10,000 shares with no par value, of the Carthage Power Corporation, which furnishes the hydro-electric power for the operation of the mill.

The Champion Paper Company is of the carlisle group and it will be in the hands of those interests which have built up the Power Corporation of New York, of which Floyd L. Carlisle is the controlling factor. With the mill coming into the control of this organization, there is a possibility that the power may be eventually developed into electric energy and be linked with the Power corporation system.

The mill has an annual production of 8,000 tons of catalogue paper. It was purchased by the Carlisle interests from the Hanna interests, controlled by Mark A. and Carl Hanna, about a year ago.

No Changes in Pay Schedule

At the offices of the International Brotherhood of Paper Makers in Albany, it is said that there are no indications of any contemplated demand on the part of the unions for increased wages or any indication on the part of the manufacturers toward a decrease. The present wage scale expires in a majority of cases on May 1, with a few isolated cases expiring a few weeks later. The wage scale affects some 20,000 men.

Either party can make demands for increases or reductions up to April 1, the present wage contract between the brotherhood and the manufacturers containing a clause to the effect that there shall be a 30-day notice given of any contemplated wage change.

At the present time, the brotherhood is devoting a great deal of its time toward building up the organization throughout the paper making sections of this country and Canada. The membership slumped a year ago to such an extent that when the executive committee met, the problem of regaining these members was fully discussed, and it was with such thought in mind that it was decided to hold no annual convention, but to use the money for organization work. The principal officers in the international organization have been addressing meetings in New York state and in New England.

A record amount of pulp wood is being hauled to the railroad sidings and the banks of streams in all sections of the Adirondack mountains. The total amount cut in the Adirondacks has increased during recent winters, the farmers taking advantage of the high prices which have been offered. Scores of landowners are felling pulp wood this season, something that they have never done before. Reynolds Brothers, of Malone, will haul 21,000 cords of pulp wood to the Malone Paper Company. Already one third of the contract has been filled. The pulp logs are being taken from the Reynolds tract in the town of Brandon. Early in the winter there was an exceptionally heavy fall of snow in northern New York, but early in February much of it was swept away by a protracted thaw, which has served to hamper operations in the woods.

The Champion Paper Company mill at Carthage has been subject to severe handicaps during the past month owing to ice jams in the Black river. Part of the time only two of the eight ground wood machines could be operated.

New Steam Plant at Malone Mill

Extensive improvements are to be made at the plant of the Malone Paper Company during the summer. Three new water tube boilers of 300 horsepower each are to be installed.

READING
CHAIN AND BLOCK CORP.

THE surest proof of the value and economy of Reading material handling products is the number of additional units sold to those who know by experience the service they render.

Upon investigation you will find that many prominent paper mills have standardized exclusively on Reading products.

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Rotary cutters driven by overhead motors through Morse Silent Chains, which are totally enclosed.

Running for 13 years without one cent of expense

So says Mr. B. W. Middleton, of the Strong, Carlisle & Hammond Co., Cleveland, O., regarding a typical Morse Silent Chain installation. He says further that he has never known of one dissatisfied purchaser of Morse Silent Chain Drives.

Never-failing performance such as this is characteristic of what Morse Silent Chains are accomplishing everywhere. For complete information, consult the Morse Engineer in your territory.

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AN investment in our beater room equipment means better beaters and jordans.

Our equipment embraces the most approved and advanced designs, together with heavier construction and the most careful workmanship.

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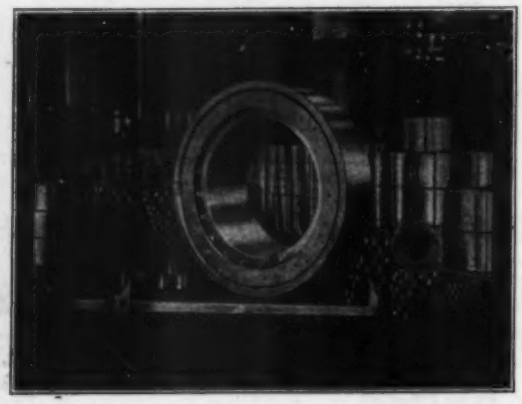
THE HART BEARING



If you have bearing troubles we are prepared to help you. Nothing too large or difficult. Our bearings are standard and extensively used in paper machinery.

Let our engineers solve your problems.

The Orange Bearing Co.
ORANGE, N. J.

FAWCUS
Herringbone Gear Reductions

They increase production, save labor and decrease wastage on Calenders. Write for literature. Special Machinery—Couplings—Gears.

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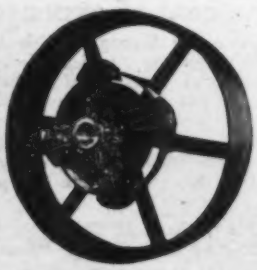

FALLS SOLID FRICTION CLUTCH PULLEY

NEW YORK 26-28 Fulton Street
Cuyahoga Falls, Ohio
BOSTON 22 Purchase Street

Catalogues upon request

The new boilers will be of the latest type and will be equipped with automatic stokers and the steam jet system for removing ashes. All hand shoveling will be eliminated. The coal will be crushed and elevated to bunkers. The bunkers will have a capacity of 165 tons. The old smoke stack will be torn down and a brick stack 135 feet high will be installed by William Summerhays & Sons of Rochester, N. Y. The boilers will be built by the Erie City Iron Works of Erie, Pa., and the stokers will be of the type E, heavy duty. They will be installed by the Combustion Engineering Company of New York.

A combination chemical and mechanical system for softening the water for boiler feed will be installed by the Cochrane Corporation of Philadelphia. This process is to eliminate scale from the water used in paper making.

Work on the construction of the new plant will be started as soon as the weather permits, probably about March 15 or April 1. Orders have been placed for all the material and contracts have been signed. The new installation will give the Malone Paper Co. one of the most efficient power plants in northern New York. H. G. Shortt, of Carthage, will be the engineer in charge of the construction work. The continuous operation of the mill will not be interfered with.

Several improvements have been made in the equipment of the mill during the past winter. Two Bird rotary screens have been installed to replace the old style flat screens, and three Bird save-alls have also been installed.

John F. Carroll, until recently superintendent of the Oswegatchie Paper Company at Natural Dam, N. Y., has accepted a position with the E. B. Eddy Paper Co., Ltd., of Hull, Quebec. Mr. Carroll is superintendent of a 100-ton daily ground wood mill, and also assists in an advisory capacity as the general manager of the company.

William H. McCarthy, woods contractor for the Gould Paper Co., of Lyons Falls, who commenced work on the Montague tract December 14, has come out of the woods with his crew of 50 men, nine teams and two tractors. He said that only once in 31 years did he find deeper snow in the woods. At one time there was six and a half feet of snow in the woods, but it went suddenly. His contract called for the cutting of 7,000 cords of pulp wood and the contract was completed, part of the hauling being done on bare ground.

Mark S. Wilker, president of the Diana Paper Co., of Harrisville, is one of the leading figures in a merger of the automobile bus lines in northern and central New York. A number of bus lines have been purchased by the new syndicate, giving control of lines reaching from the Canadian border nearly to the Pennsylvania border. The company plans to incorporate for $2,000,000, making it the largest automobile bus line company in the United States.

Carlisle Interests Purchasing Three I. P. Co. Mills

Negotiations are underway for the purchase of the three paper mills and power rights of the International Paper Co., at Glen Park and Brownville, by the Power Corporation of New York, which controls the Northern New York Utilities, Inc., and its string of power plants on the Oswegatchie, Black and Beaver rivers. The Power Corporation of New York is headed by Floyd L. Carlisle, president of the St. Regis Paper Company system, and supplies electric power to all the paper mills in the Carlisle system. Officers of the Power Corporation say that the negotiations have not reached a point where they are closed.

It is understood to be the intention of the Power Corporation to construct one of the largest hydro-electric development plants in the East, second only to the Niagara plants. The plan is to dig a huge canal from No. 4 mill at Glen Park to the C. R. mill at Brownville, taking the water from Black river and returning it to that stream. This would give a head of over 90 feet and would enable the development of about 30,000 horse power and possibly more.

The International Paper Co. owns all the water power rights between the two mills and much of the land along both sides

"This Foote IXL Speed Reducer takes the place of 8 pulleys, 4 jack shafts with hangers and 4 separate belts. It gives us a speed reduction of 300 to one, yet the space occupied is almost negligible.

Many Other Advantages

Besides saving valuable space we have eliminated the danger from exposed moving parts, save much power and do not have to worry about losing time for repairs and adjustments."

Foote IXL Speed Reducers

are compact, safe, efficient, enclosed unit drives for reducing motor speeds in any desired ratio. They require practically no attention and insure continuous uninterrupted production. They are ideal for driving. Foote IXL Speed Reducers are extensively used by leaders in the pulp and paper industry for unit drive of grinders, agitators, wet pulp machines, conveyors and elevators or whenever it is desired to step down speed of motors for any purpose.

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Cut Gears of All Kinds
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Special Machinery

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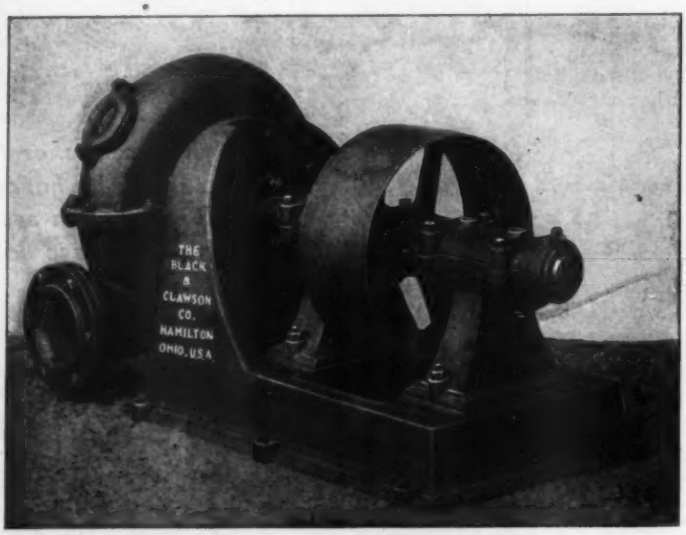
The BLACK-CLAWSON CO.

Leading Builders of Paper and Pulp Mill Machinery

Hamilton, Ohio, U. S. A.



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Our large plant and special equipment with skilled and trained help enable us to render efficient and prompt service and satisfaction to a customer.

The best is none too good. Let us serve you.

LINDSAY WIRES

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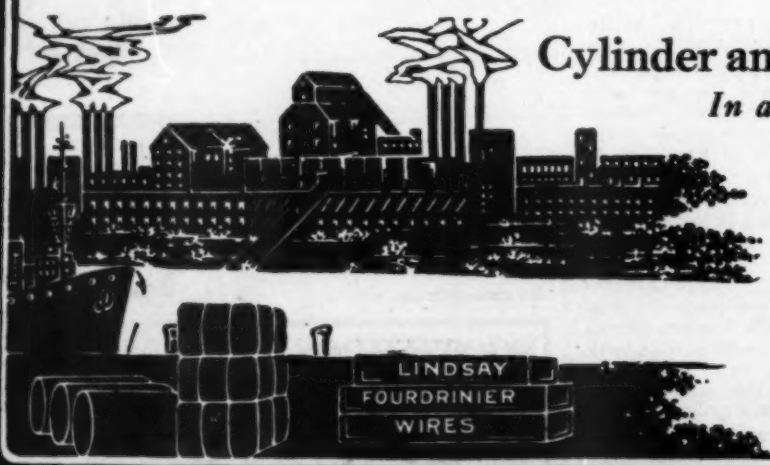
DURABLE AND DEPENDABLE

Made in all sizes



Cylinder and Washer Wires

In all Meshes

The Lindsay Wire Weaving Company

Collinwood Sta. Cleveland, Ohio

of the river. It is understood that all of this land is to be included in the purchase. The deal includes not only the water rights and land, but the three mills in the Watertown group, No. 4 mill at Glen Park and the C. R. Mill and the Brownville mill at Brownville. The three mills have been idle a greater part of the time since the strike several years ago, and much of the equipment has been moved to other mills. For a time it was reported that the International intended to open one of the mills as a pulp mill.

The Carlisle power interests are already hooked up with the Niagara power lines in furnishing power throughout the central part of New York state and the installation of a new transformer at South Edwards makes it possible to hook up with the power developed in the St. Lawrence river.

Northern New York paper manufacturers express themselves as much pleased with the support that they are receiving from the National Publishers' Association. The national publishers have condemned the threatened embargo on pulp wood by the Canadian government, declaring it inimical to the interest of the country. "The Canadians did not expect the opposition of the publishers," said J. V. Baron, vice-president and general manager of the Sherman Paper Co. "They expected that the publishers would keep the price down and make the American manufacturers absorb the amount of the export tax, which would eventually drive them out of business. The publishers have looked ahead and realize that the export tax would eventually fall upon their shoulders, and have come into the fight with the paper makers."

During the recent blizzard which swept northern New York, the payroll of the Newton Falls Paper Co., containing several thousand dollars, became stranded in the tie-up of the mails. The money, which was to have been used in paying off the men on a Friday did not arrive until Monday. Food supplies were also delayed on account of the railroad tie-up and the shelves of the grocery stores were nearly bare. As soon as the movement of trains was resumed, the payroll was rushed to Newton Falls, and a supply of food was sent there to relieve the shortage.

The Northern New York Utilities, Inc., one of the Carlisle group, has opened its new power house on Sewall's Island, Watertown, built on the site of the old sulphite mill of the International Paper Company. The new plant develops 2,500 horse power. The Utilities leased the power rights of the International Paper Co. for 50 years at the rate of $10,000 a year. The power plant cost $350,000.

The mill of the International Paper Co. at South Glens Falls has reopened, giving employment to about 250 men. The mill has been closed since June, 1924.

Pacific Coast News

March 2, 1925.

Lewis Company Building Homes

The paper mill at Alderwood under the name of the Lewis Pulp and Paper Co. have announced as their officials Mr. A. D. Bowen, president and treasurer; Raymond G. Moore, secretary, and Fred H. Fuller, vice-president and general manager.

Mr. W. J. Read, who is at the head of the company that will handle the development of the town, states that over four hundred homes will be built before the end of the present year at the townsite.

Mr. Stuart French, with A. D. Bowen, who is engineer in charge, during the months of investigation are making their headquarters at Alderwood. Also Mr. Cowing, who has charge of the timber supplies, is staying at Alderwood, and with the rest of the officials will soon build a permanent home at the new place.

The new Alderwood Paper Mill will make Vancouver, Wash., a distinctive paper manufacturing center, with the Columbia River Paper Mill within the city's limits and both the Crown-Willamette mill and the Leadbetter mill only a few miles away at Camas. It is very likely that in a very few years the paper

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Protection of metals regardless of conditions

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"Excelsior" Felts

For EVERY GRADE of PULP & PAPER

We continue to maintain at the top the quality of Excelsior Felts, as we have done since we, as pioneers, made *the first endless paper machine felts manufactured in America.*

Seamless felts for fast running.
Satin Style felts for finish.
Special felts to meet every condition.
Send us your felt problems.

KNOX WOOLEN COMPANY
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THE DRAPER FELT

Unexcelled for strength, openness, resiliency, and general running qualities. Made to meet the most exacting conditions on all types of machines and all kinds of papers. Only one grade and that the highest.

Made by

DRAPER BROTHERS COMPANY

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Woolen Manufacturers Since 1856

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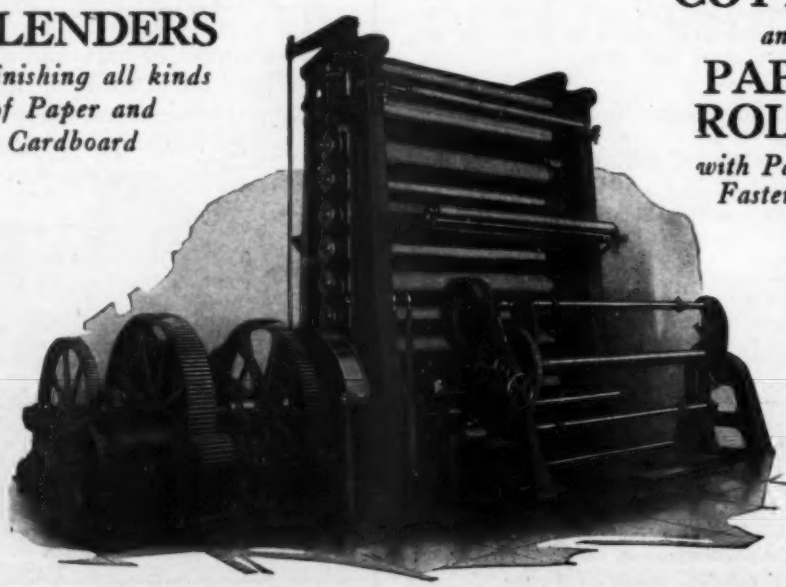
Holyoke Machine Co., Holyoke, Mass.

Makers of Improved Machinery for Wood Pulp and Paper Mills

LARGEST MAKERS *of*
CALENDERS
for finishing all kinds of Paper and Cardboard

COTTON *and* **PAPER ROLLS** *with Patented Fastenings*



Platers,
Washing and Beating Engines,
Wood Pulp Grinders,
Barkers,
Chippers,
Rag and Paper Dusters

Rag Cutters,
Hydraulic Pumps and Presses,
Hercules Water Wheels and Governors

industry will be the largest industry in this section of the state.

Converting Plants for Longview

Operations will begin early in April on the Pacific Straw, Paper and Board Company plant at Longview, which is capitalized at $500,000. Mr. Chas. F. Schaub, president of the company, also states that he expects another plant to locate in Longview that will manufacture paper boxes, berry crates, egg case fillers, etc., using much of the output of the Pacific Straw Paper and Board Company.

Both the president and Secretary Sweet have been working on the organization plans for two years, and they will draw no salaries until the plant is in operation.

The Austin Company, builders and engineers, Dexter Horton Building, Seattle, have obtained the contract to construct a paper mill at Millwood, Wash., for the Inland Empire Paper Co., at a cost of $130,000. Construction will begin about the middle of March.

The industrial insurance department of the state of Washington paid claims of $22,557.65 in class 24, which includes paper and pulp mills, in the year 1924. The state has a pension reserve for this class of $12,757.21.

The Crown Willamette Pulp and Paper Company, at Kelso, Wash., is preparing to extend its logging railway up the Elochoman River, back of Cathlamet, Wahkiakum county, where a large area of timber awaits development.

The Inland Empire Paper Co., of Spokane, Wash., has recently awarded the Austin Company, engineers and builders, a contract covering the design, construction and partial equipping of mill unit 145x255 feet, two stories high. The new building will house paper machines. It is of steel frame and reinforced concrete construction. Approximately 175 tons of steel will be used in the frame. When completed the Empire Paper Co. will have an additional 36,000 square feet of floor space, with maximum natural light and ventilation. The Austin Company has agreed to rush the work through to completion in 90 working days.

Ohio News

March 2, 1925.

Kellogg Addresses Superintendents

Due to the opportunities of great value in hearing a speaker of such ample qualifications as R. S. Kellogg, chairman of the National Forestry Committee, the Miami Valley Division of the Pulp and Paper Mill Superintendents' Association invited the Middletown Foremen's Club to its March meeting Saturday night, February 28, at the Hotel, Manchester. The fact that Middletown is one of the great centers of fine paper manufacture in the United States brought Mr. Kellogg to Middletown on his tour of this part of the country in the interest of his committee. As secretary of the News Print Service Bureau, of New York, he is also an expert upon paper making and has been addressing numerous paper manufacturers' gatherings during his tour. Other nearby points in his tour were Hamilton, O.; West Carrollton, O.; Lafayette, Ind., and Columbus, O.

His speech here was upon "The Paper Industry and Timber Supply," which he went into thoroughly by explaining the theories of forestry and the inseparable connection of it with the manufacture of paper. "The United States is the greatest paper-consuming country in the world," he said. "In 1920 her per capita consumption of paper was 148 pounds, as against 76 pounds in Great Britain, 45 pounds in Germany, 33 in Scandinavia, 12 in Japan, and 6 in Russia, and it is still growing. About a third of this consumption in the United States is the result of the newspaper-reading habit of the American people. The size of newspapers has increased from year to year, until in 1924 those having circulations in excess of 100,000 copies averaged 28 pages for the daily editions.

"The newsprint paper used in the United States in 1924," he went on, "would blanket 12,000,000 acres, or nearly the

Ask your jobber

Getting more heat from the same steam

Temperature increased 9 deg. without any increase in steam pressure

ONE of our field engineers reports—"A dryer fed from a 14-lb. line on a blow-through system was discharging into a drip header with 5-lb. back pressure. The temperature as shown by thermometer in the discharge line was scarcely 235 deg. A valve was closed to prevent the blow-through from this dryer and it was drained with an Armstrong Trap. The temperature quickly went to 244 deg., showing a 9 deg. increase without any increase in the steam pressure feeding the machine."

Almost any temperature change can be made and maintained, and uniform paper with a predetermined moisture content obtained, when your dryers are equipped with an Armstrong system. The Armstrong was designed for paper service, and its simple, sensible inverted submerged bucket principle has made it a part of the industry. It can't air-bind—steam never reaches its valve making scoring practically impossible—oil and sediment can't clog it, because it flushes out the sediment first when discharging—any pipe line can support it—and it's low in cost. Your copy of the free catalog is waiting—or do you want a 90-day demonstration?

Armstrong Machine Works
322 Maple Street Three Rivers, Michigan

Armstrong Steam Trap

THE standard Armstrong Trap is furnished for pressures from 0 to 300 lbs.—for service on vacuum where inlet pressure is greater than outlet pressure—for draining water from compressed air expansion tanks, separators, etc.—for service on oil. The Armstrong Special is furnished for pulsating pressures.

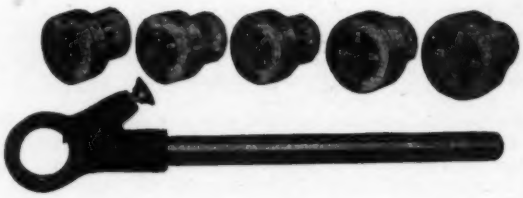
P.I.3F-BTG

A "TOLEDO" PIPE THREADER

Just Right for Corner Jobs

No more twisting or stretching to thread the pipe tucked away in the inaccessible corner. This little "TOLEDO" No. 00 ratchet threader will reach the out-of-the-way job and cut the thread on ⅛ to ¾" pipe with a few easy strokes of the ratchet handle. It produces smooth perfectly tapered threads and is a tool that should be a part of every plant equipment.

A postcard to us will bring you further information, as well as a copy of our large catalog showing our complete line.



THE TOLEDO PIPE THREADING MACHINE CO., TOLEDO, OHIO

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"You can say good-bye to rust when you paint with BITUMASTIC"

The Paint Question

Your search for a paint that will stand up under moisture, chemical fumes and heat conditions comes to an end when you begin using BITUMASTIC SOLUTION. It gives enduring protection to metal buildings and roofs, structural steel, tanks, pipes, stacks, boiler fronts and breechings and other steel surfaces. It has a fine glossy finish that lasts. The sooner you start using BITUMASTIC, the sooner your worry over the paint question ceases.

The most convincing argument in favor of the use of BITUMASTIC SOLUTION is the performance of the paint itself. We are willing, therefore, to send a sample can, without charge, to interested executives and engineers.

SINCE **BITUMASTIC** 1854

WAILES DOVE-HERMISTON CORPORATION

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combined areas of New Jersey, Massachusetts and Connecticut. It would belt the earth three quarters of a mile wide at the equator, or make a standard roll 72 inches wide that would unwind 16,500,000 miles or reach to the sun in 5 years and 8 months."

"Paper is so cheap and abundant that we don't think about the time when it was not. It is only within the last fifty years that the world has begun to have enough paper. There never was enough until processes were developed for making paper out of wood instead of rags. The highest grade of paper is made from rags, the next highest from wood pulp and rags. Newsprint is made entirely from wood. The 2,900,000 tons of newsprint paper made in North America last year required 4,300,000 cords of wood. But where are we going to get enough wood, now that we confront the magnitude of the problem of manufacturing paper.

"Forestry is not a law compelling the planting of a new tree for every one cut, nor is there such a law in any country, popular notions to this effect notwithstanding. Neither is there a law limiting the cut to certain sizes and kinds of trees; nor is forestry to be accomplished by the arbitrary control of any public body over private operations. Forestry is the application of definite scientific principles to the growing and using of timber crops. It must be practiced by the government upon public property in order to insure some supply of forest products. Because of the long-time investment and the comparatively small return, together with hazards of fire, a considerable area of publicly owned forests will always be needed although public ownership of the entire forest area is neither necessary nor desirable."

Arthur C. VanKirk

In the death of Arthur C. VanKirk, February 28, the paper industry loses a valued man. Mr. and Mrs. VanKirk went to Celina, Ohio, six months ago in the interest of his health and it was there that he died.

The deceased was master mechanic of the Gardner & Harvey Paper Company many years and was widely recognized by paper men over the country as an inventor and patentee of paper manufacturing machines and devices and automobile attachments.

He is survived by the widow, one daughter, Mrs. Horace M. Potter, wife of the managing editor of the Cincinnati Enquirer, and a brother, Thurman VanKirk, of Dayton.

A contract to furnish 6,000 tons of paper for the government printing office, has been awarded the Champion Coated Paper Company, of Hamilton. Congressman Roy G. Fitzgerald, who met with the Joint Committee on Printing of the House and Senate in behalf of the Champion company, was instrumental in swinging the big order to the Hamilton concern. Senator Willis also was an interested projector in favor of the Champions receiving the contract.

B. M. Bishop Attends Western Board Meeting

B. M. Bishop, chairman of the general board division of the American Pulp and Paper Mill Superintendents' Association, and one of the members of the national program committee for the annual convention in Niagara Falls in June, met with the Western Board Division in Monroe, Mich., February 20 and 21, to advance plans for the annual meeting. He was accompanied by Harold Harvey, who represented the officials of the Gardner & Harvey company, in the absence of his father, Tom Harvey, who is always one of the interested promoters of the convention plans.

Mr. Bishop brought back some live information of the coming convention that had been proposed by Fred Boyce, the first president, Peter J. Massey and other national officers. The committee accomplished a great deal toward formulating definite plans for the convention June 4, 5 and 6.

Frank Smith, owner of the Frank Smith Paper Co., which recently put into operation one of the most modern and unique paper manufacturing plants in the world, will soon start work reclaiming a large tract of land along the Dixie highway south of the city. The land which fronts the Miami river

GURNEY
BALL BEARINGS

for
Greater Capacity

COMPARE Gurney Ball Bearings—Maximum Service—Maximum Capacity type—with like sizes of other bearings. Note the greater number of maximum size balls per bearing. The race curvature is such that they have increased areas of contact.

These are the secrets of their ability to safely carry greater loads than other bearings of equal size. This is done without affecting the life of the bearing or its efficiency.

Gurney load capacity ratings are considerably higher than are the ratings for bearings of other types—and you will find Gurneys performing unfailingly in any number of machines where this additional capacity is essential to the successful performance of the machines.

GURNEY
BALL BEARINGS

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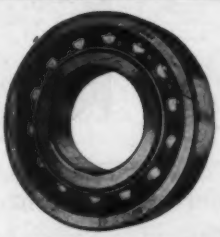

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Morey Paper Mill Supply Company

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BRANDON 3-PLY "TRI-UMPH" AND STANDARD WARP

Deckle Tape and Cutter Webbing—Cotton and Rubber Belting—Enamelled, or Rubber, Fourdrinier Aprons—Rubber Splicing Tissue—Neutral Soap Powder—Dryer Felt Sewing Twine —Superheat Asbestos Packing—Rubber Sheet Packing—Steam and Water Hose

SIMONDS

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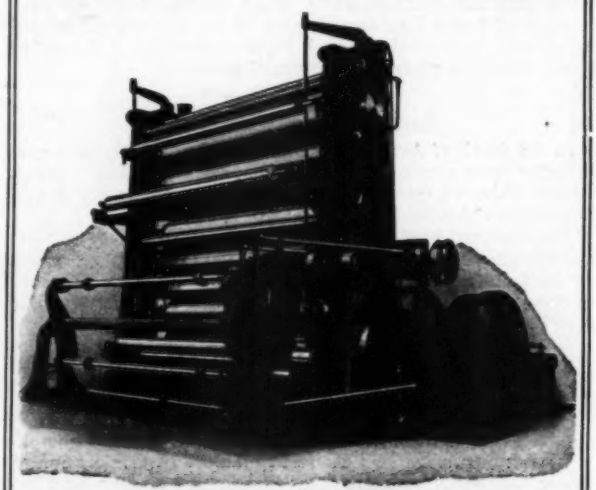
Paper Knives

Simonds SAW AND STEEL CO.

Fitchburg, Mass. Chicago, Ill.

NORWOOD SUPER CALENDERS



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Paper Finishing Machinery

NORWOOD ENGINEERING CO.

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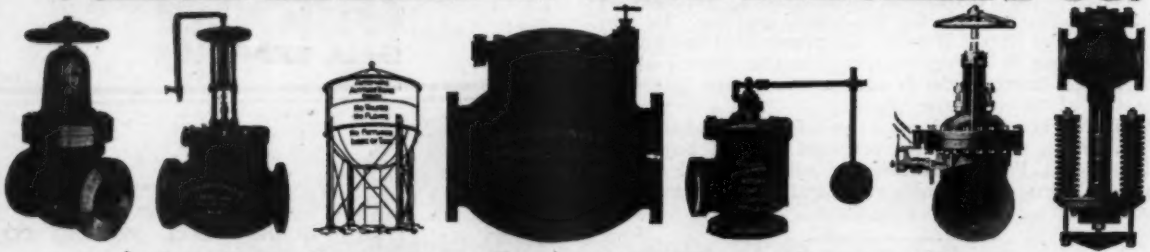

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"We Challenge to Test for Merits Any Automatic Steam or Water-Service Valves in the World"

1240 FULTON BUILDING. PITTSBURGH, PA.

will make valuable building sites after the river bottoms have been dredged, depositing the sediment in the low lands, according to his plans. It is thought Mr. Smith contemplates extending his interests in this section.

Tom Harvey, director of the Gardner & Harvey Paper Co., has just returned from a trip of several months to Florida, West Indies, the Bahamas and Panama Canal section. Several months ago he suffered a nervous breakdown and the trip, taken in the interest of benefiting his health, more than accomplished its purpose. He is back at his desk again.

George Sutphin, traffic manager of the Gardner & Harvey Paper Co., was elected to serve on the 1925 governing board of the Miami Valley Traffic club at the third annual meeting of the club in Dayton Thursday, February 26. Others to serve on the board are Maurice T. Otto, traffic manager of the Dayton Chamber of Commerce; R. F. Schwindeman, Dayton agent of the Universal Carloading and Distributing Company; F. F. Kator, assistant general traffic manager of the G. H. Meade paper company, and H. M. Browne, general agent of the M. K. & T. railroad, Cincinnati. An address by Samuel O. Dunn, editor of 'Railway Age,' was the principal feature of the program, radiocast by station WDBS, of Dayton.

Foreign Correspondence

Coming-of-Age of a British Paper Trade Organization

The National Association of Wholesale Stationers and Paper Merchants has recently celebrated its 21st birthday, and in recognition of this event has issued a beautifully produced little brochure dealing with the history, program, objects and aims of the association.

In 1903 the foundation of the association was laid by Mr. Arthur V. Hunt and Mr. Evan Spicer, and was the first effort to safeguard the interests of wholesale stationers and paper merchants. Today the association includes most of the principal houses in the wholesale stationery and paper trade, and it is working energetically to extend the membership and bring about far-reaching reforms for the general benefit of the trade.

Second Year of the British Empire Exhibition

With little more than three months to go before the reopening of the British Empire Exhibition, Wembley is now the scene of daily increasing activity. Every day adds its quota to the number of exhibitors in the "home" sections, and the overseas commissioners are vying with each other in arranging displays which shall increase the attractiveness of their various pavilions. Home industries are again to be displayed in the Palace of Industry and the Palace of Engineering and in numerous smaller pavilions and kiosks throughout the grounds. In the Palace of Industry the system of composite exhibits which was so popular last year will be carried a stage further, and the paper trade will again be represented as a group. A strong display by the printing and allied industries will be one of the chief attractions of the southwest corner of the Palace of Industry. In it will be included exhibits by typical printing, stationery, map-making and publishing firms.

Another New Source of Supply

The latest official report of the Hydro-Electric Department of Tasmania announces definitely that the Amalgamated Zinc Company intends to enter on the manufacture of paper from Australian wood. In association with the Bureau of Science and Industry exhaustive experiments are being carried out, not only in regard to mixing hardwood and softwood, but also on the use of hardwood pulp only, and it has now been demonstrated that an excellent newsprint can be manufactured from 100 per cent hardwood pulp.

A director of the company is now on his way to England, where the whole project will be tested on a commercial scale, in association with one of the British paper manufacturers. It seems probable that the results secured in Australia will be repeated in London, and that within a few months arrange-

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Digesters
Diffusers
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Disc Evaporators
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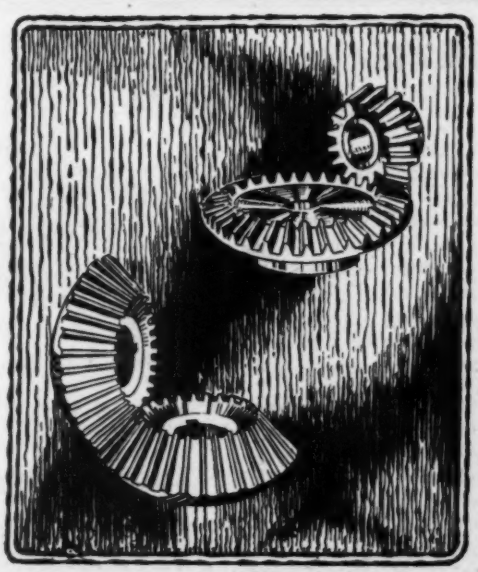

Gears on a "Quality-Service" Basis
William Ganschow Company

24 N. Morgan Street
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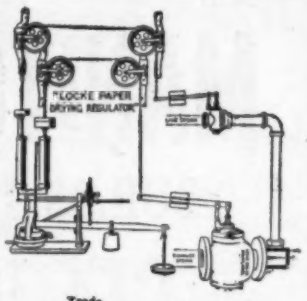
This regulator controls both live and exhaust steam for any purpose where steam is used, or it will control the direct steam when used alone. It unlike, both in construction and operation, any device that has heretofore been designed for this purpose. Controls not only temperature of the dryers when paper is running over them, but maintains the same temperature whenever there is a break in the paper. This machine is most sensitive to any change in temperature of dryers, yet it has been found to be perfectly reliable and what is more, is not continually getting out of order.



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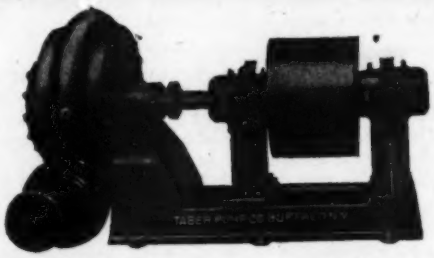

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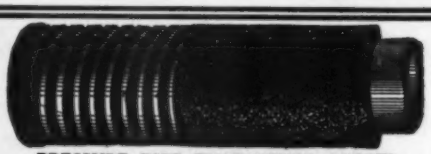

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WYCKOFF WOOD PIPE

The Paper Industry is successfully using thousands of feet of this Pipe and they find it to be the best conveyance for Paper Stock and Acids that can be obtained.

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Making the coal go farther

IT CAN be done—wherever you are using a pressure higher than the absolute minimum pressure required. The Davis Pressure Regulator cuts excess steam pressures down to the lower level where they belong; the annual saving brought by clipping pressures is enormous.

This regulator does the work with almost no attention. It is quality built throughout and accurately machined. The catalog describes the entire Davis line. You should have it. (Free, of course.) Address the G. M. Davis Regulator Co., at 414 Milwaukee Ave., Chicago.

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ments will be made which will end in the establishment of this extremely important industry in the northwest of the state.

It is probable that the completed industry will involve a capital expenditure of nearly £3,000,000 and the employment of approximately 1,000 hands.

Revised Edition of Operating Reports Issued

The revised edition of the Manual of Instructions for Paper Mill and Steel Plant Operating Reports has just come from the press, dated February, 1925. The Manual has been prepared by Mr. George D. Bearce, engineer of the News Print Service Bureau, 342 Madison Ave., New York City, and is supplied free of charge to all News Print Service Bureau members, and at $5.00 per copy to anyone else who desires to use it.

In Booth 104 at the Informashow, to be held in Milwaukee Auditorium, Milwaukee, Wis., May 25 to 28, 1925, purchasing agents will find an interesting display of valves of bronze, iron and steel; pop safety, blow-off and non-return valves; water columns, water gauges and gauge cocks; lubricators; oil pumps, hand and mechanically operated; oil and grease cups; whistles; cocks, etc., manufactured by the Lukenheimer Co., Cincinnati.

The Hill Clutch Machine & Foundry Co., of Cleveland, have recently appointed T. L. Rose & Son as their representative in Pittsburgh and adjacent territory. Mr. Rose has been prominently identified in the power transmission field for better than twenty-five years, and has excellent facilities for representing the comprehensive line of "Hill Clutch" mill equipment.

Foote Bros. Gear & Machine Co. has recently completed arrangements with Gibbens & Gordon, 532-534 Canal Street, New Orleans, La., for the distribution of Foote IXL Speed Reducers and Gear Products for the territory surrounding New Orleans.

The De Laval Steam Turbine Co., Trenton, N. J., announces that all products of that company are handled exclusively in New England by the Turbine Equipment Co. of New England, Chamber of Commerce Building, 80 Federal Street, Boston, Mass.

Mr. Lynn W. Nones has been appointed Eastern sales manager for the Diamond Power Specialty Corporation, in charge of the Atlantic Coast offices from Boston to Charlotte, inclusive. His office is at 90 West Street, New York.

FOR SALE: Slightly Used Beaters.

2—1200 Lb. Iron Tub Beating Engines.
1—2000 Lb. Breaker Beater (nearly new).
1—1200 Lb. Breaker Beater. (Can be made into a regular beating engine.) Will sell the above "as is" or factory rebuilt. Also:
1—Pony Monarch Jordan, belt drive, rebuilt.
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MANUFACTURERS OF
WARREN IMPROVED CALENDER DOCTORS
With Flexible Blades, Universal Adjustment and Control
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WARREN IMPROVED PATENT DOUBLE DRUM WINDERS
Patent BALL VALVE Hydrant
Stock Circulating Systems *and*
other Paper Mill Specialties
SEND FOR OUR BULLETIN

The Stickle system of removing air and condensation from the dryers, combined with the Stickle automatic control of steam, will produce a more uniform dried sheet with less steam consumed than can be done with any other equipment. We will guarantee this under a competitive test.

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Paper Machinery For Sale

One Pusey & Jones Fourdrinier Part takes wire 126″ x 60′ equipped with New Century shake Millspauch suction couch roll and Connersville vacuum pump.

Moore & White four drum winders.

Two 72″ nine roll Holyoke super calenders.

Four 66″ nine roll Holyoke super calenders.

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Four 60″ Hamblet sheet cutters with Moore & White layboys.

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Complete Marshall Drive for Paper Machine —Pusey & Jones self-contained type with friction clutch, cone pulley and Mortise gear.

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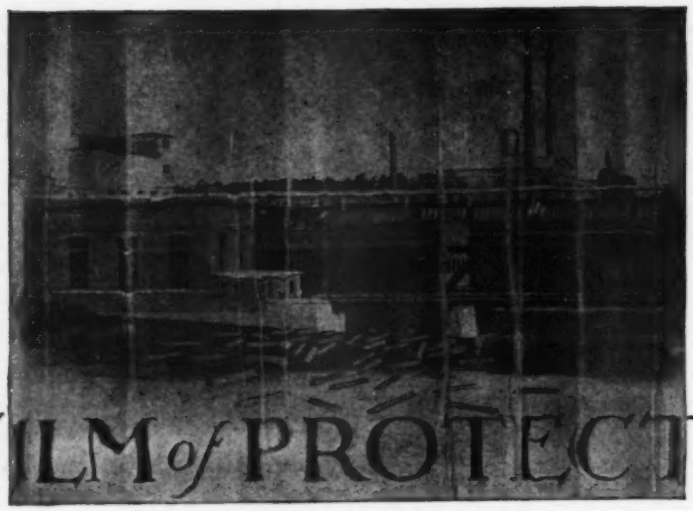

The FILM of PROTECTION —for Paper Mill Machinery

WHEN oil goes into action, it forms a thin film over all the vital parts of your machinery. A film that comes between all the whirling, sliding surfaces and prevents the chafe of metal against metal.

This film must be kept unbroken, in spite of the constant threat of grinding, tearing friction—the lash of searing, scorching heat.

Under that persistent punishment the film of ordinary oil soon breaks and burns. Through the broken, shattered film, hot metal is bared to friction. Protection from deadly heat and friction is gone. Power is wasted. Costly bearing surfaces are damaged.

The "Film of Protection"

Tide Water technologists spent years studying the chemical and physical characteristics of oils and oil films, and the application of different oils and greases to meet different operating conditions.

In the automotive field they perfected the well-known Veedol oils. In the lubrication of Paper Mill Machinery they were equally successful. Here they have produced a series of lubricants, called the Tide Water Power Group. Each lubricant comprising this Power Group covers a particular phase of paper mill machinery lubrication and the entire group completely covers this field.

Engineers who are using the Tide Water Power Group in their mills know that these lubricants form the perfect "film of protection" that safeguards their machinery from the ravages of deadly heat and friction. This means fewer breakdowns and shutdowns; higher horsepower efficiency, greater operating efficiency.

Such results surely justify the assertion that all lubricants are *not* alike. When heat-lashed and friction-worn, their films show radically different fighting qualities. Such results should certainly merit your immediate consideration, with a view to putting the "film of protection" at work safeguarding your mill machinery.

Let us have the opportunity of sending one of our Staff Engineers to make a survey of your mill's lubrication requirements and to discuss the Tide Water Power Group with you.

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TYCOL GEAR COMPOUND
A soft, semi-fibrous grease for enclosed gears under heavy pressures.

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For dryer and other bearings operating at high temperatures.

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A hard grease for replenishing Tycol Yarn Grease.

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For beater bearings where high temperatures, heavy pressures and water are present.

TYCOL LUBRICANT No. 1
A medium hard grease for Jordans, grease lubricated calender rolls, and for general use.

TYCOL GEAR COATING SOFT
A viscous lubricant especially recommended for use on slow moving open gears.

Technical Developments in the Paper Industry

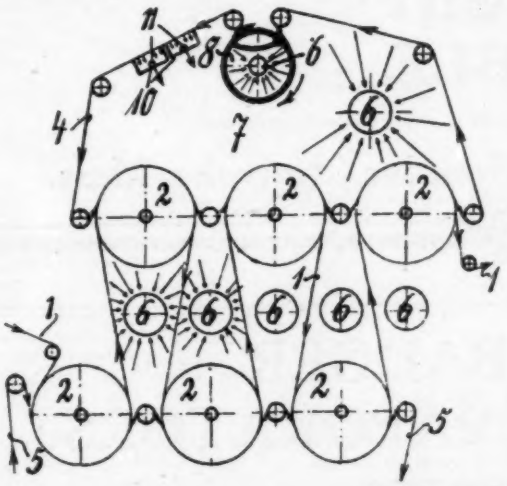
Domestic and Foreign

The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

Recovery of Heat in Drying Paper

GERMAN Patent No. 401,936 is concerned with the recovery of heat which is contained in the vapors of water and steam that are evolved from the drying part of paper-making machines.

The apparatus that is used for this purpose is seen in the accompanying illustration. The principle of the process is to recover the heat as close to the source of its liberation as



possible. In this manner only the uncondensable gases are drawn away. The device that is employed for this purpose consists of a heat exchange apparatus with cooled surfaces with which the vapors come in contact after being allowed to mix with the smallest possible amount of air.

The paper web, in the figure, is seen at (1). The web is led over the guide rolls and drying cylinders (2). (4) and (5) are an upper and lower felt. The arrows show the direction in which the various parts of the apparatus rotate and move. The heat-exchanging apparatus is built into the machine between the upper and lower drying cylinders (2). It is represented as (6). Another section of the heat-exchanging apparatus is seen at (6) above the space (7), and this apparatus is encircled by the felt (4). Then again another heat-exchanging apparatus is built into the hollow space of the suction roll (8), which is used as a felt dryer. The top felt (4) is led over two suction boxes (10) and a heat-exchanging apparatus (11) is also built into them.

Wood Pulp Bleaching

A NUMBER of experiments were carried out with sulphite pulp. The bleaching was carried out at a temperature varying between 30 and 35 degrees C, and with a concentration of pulp equal to 6 per cent. Free circulation of air was allowed during the experiments in order to remove the carbon dioxide gas that is liberated during the process. The influence of various acids was studied, using one-fourth of the equivalent of acid required to liberate the whole of the chlorine. When the acid was added all at once, it was observed that the chlorine was liberated and the cellulose was severely attacked by it.

Consequently for the comparative tests the addition of acid was made in stages. The use of hydrocloric acid showed no advantage over that of sulphuric acid with respect to the percentage of ash in the bleached washed pulp. In every respect, the warm bleach with ordinary alkaline bleach liquor and free aeration gave superior results to the acid bleach under the same conditions. The yield was higher, the time that was required for exhaustion was much less, and the analytical characteristics of the cellulose were superior. The alpha cellulose determination is not regarded as free from objection, and the bartya resistance value, corrected from the pentosans, is suggested as a truer index of the purity of the bleached wood cellulose. When the bartya resistance value, uncorrected, is less than the alpha cellulosem, it is regarded as a sure indication that acid bleaching has been employed, while the contrary indicates an alkaline bleach. The use of acids during bleaching gives an abnormally high copper value. Acetic acid acts just as injuriously as the mineral acids. Under certain conditions, it is even more harmful than the mineral acids, since it is continuously regenerated. The use of the acid bleach is only justifiable when it is necessary to bleach in the cold. In that case the acid bleach acts more rapidly than the alkaline bleach. Paper Maker and British Paper Trade Journal, 1924, 515.

Tambookie Grass for Paper Making

TAMBOOKIE grass is a product that grows in certain parts of South Africa. The South African Journal of Industry, 1924, pages 745-752, describes certain experiments on the use of this grass in the manufacture of paper pulp. The grass is first freed from the flowering tops, and when analyzed in this condition it shows that its content of cellulose is 58.7 per cent. The grass in this condition was cooked experimentally under varying conditions by the soda process in apparatus of a somewhat improvised nature. Digestion for five hours with 20 per cent caustic soda figured on the weight of dry grass. The digestion is carried out under a pressure of seventy pounds, and the results that were obtained in this manner were found to be most satisfactory.

The yield was from 46 to 47 per cent of pulp, figured as dry pulp on the weight of dry grass. The pulp was light in color and required from 6 to 7 per cent of bleaching powder to color it white. The average fiber length in the mass of pulp thus manufactured was found to be 1.5 millimeters. The beaten pulp possessed the power of felting well and gave a strong sheet of paper. Tambookie grass pulp, it was concluded, should be suitable for making good grades of white paper, and could be advantageously used in admixture with short-fibered pulps.

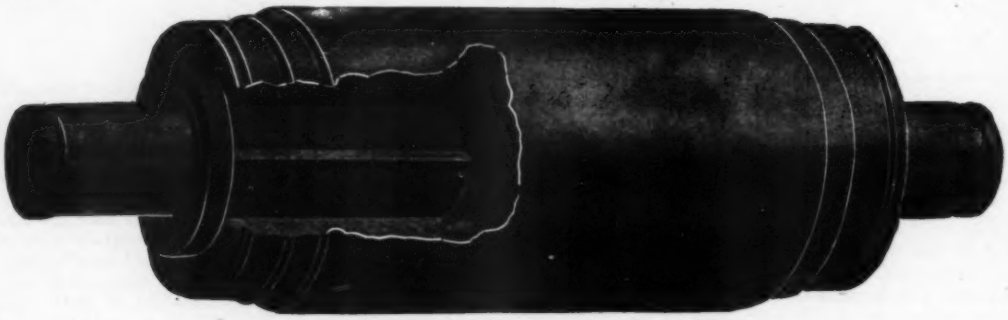
Paper from Pure Rye and Wheat Straw

AN INTERESTING process which uses rye and wheat straw for the manufacture of paper is described in the German journal, Chemiker Zeitung, 1924, page 881.

The chopped straw is treated with 10 per cent of its weight of magnesium chloride. The treatment is carried out in an autoclave. Digestion is effected under a pressure of six atmospheres, and is complete within a period of four to five hours. During this period the maximum pressure, which is equivalent to a temperature of 162 degrees C, is maintained for at least one hour.

The fiber that is obtained in this manner is claimed to be longer and stronger than that obtained by the old method of boiling with lime, and has not the same characteristic bright yellow color. The paper that is manufactured with this pulp resembles more that made from brown wood pulp. A variation of the process consists in digesting as above at a pressure

PERKINS CALENDER ROLLS



Resistant
Resilient
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Note the PATENTED SPLINE, which keeps heads or roll from turning on shaft.

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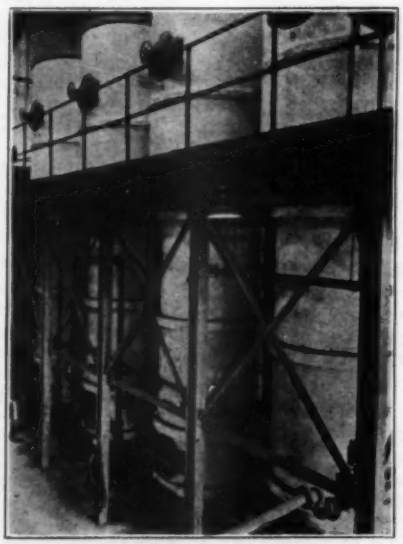

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MAXIMUM
STEAM ECONOMY

NO ENTRAINMENT

SODA and
SULPHATE
PROCESSES

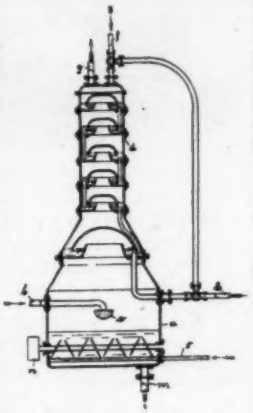
E. B. BADGER & SONS CO., Boston, U. S. A.

of two atmospheres, and milling the half-digested stuff with 5 per cent of sodium hydroxide in the kollergang. Straw papers can also be manufactured without any boiling, simply by milling the straw in the kollergang with the addition of a salt and completing the disintegration in the beater.

For further details see Chemiker Zeitung, 1924, volume 48, page 881.

Recovery of Free Sulphurous Acid in Waste Liquors

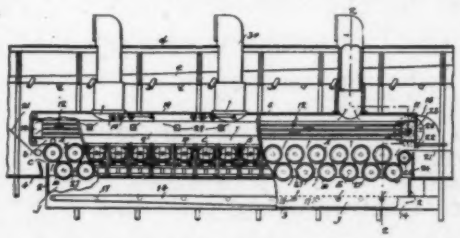
A PIPE which leads from the sulphite digester, shown as (a) in the accompanying illustration, is introduced into the container (a). This pipe is provided with a spray nozzle at the end and in this manner the liquor, from which it is desired to remove the free sulphurous acid in the form of sulphur dioxide, is highly atomized. The gases which are freed in this manner, that is through the action of atomization, rise in the column (d). Pipe (f) conducts water into the column (d) at the top. Either fresh water or water mixed with lime is used for this purpose. The water flows down the column and thus comes in intimate contact with the sulphur dioxide gas that rises in it. The uncondensable gases are led away through the outlet (g). The liquor which collects in the bottom of the tower is removed through the pipe (h) and sent back again to the top of the tower and then allowed to flow down the same again. This process is repeated until the concentration of the liquor is sufficient to make it available for use in the digesters. Then fresh water is employed for irrigating the tower. The strong liquor collects in the bottom of the container (a) and is removed through the outlet (m).



This apparatus and process is patented in German Patent No. 406,172.

Drying Paper

THE apparatus shown in the accompanying illustration has for its purpose the drying of paper by an improved process. The apparatus consists of a number of heated dryer rolls around which the web of paper is passed. A ventilated housing is provided for these rolls and is adapted to receive the heat that escapes from the dryer rolls. The housing contains a number of conduits which are heated by the heat that escapes from the dryer rolls. Means are also provided for permitting the air to pass from the machine room into and through the conduits in the housing so that the temperature of this air is raised. Then this heated air is passed into the housing and below the dryer rolls.



For further details see United States Patent No. 1,524,507.

Improvement in Digesters

A RECENT British patent describes a very interesting improvement in the construction of pulp digesters.

The improvement refers to those digesters that work on the blow-out method. The digester is thus not emptied by hand. The present invention has for its purpose to provide improved means for washing out the digester or removing the fibrous matter from its lower part.

A number of rotary water jets are provided. The jet nozzles are carried by a rotary tube, which is a permanent fixture in the bottom of the digester, and extends through the inlet connection. In addition to the jets provided in the space between the usual false bottom and the perforated plates above the same and in the space below the false bottom, one or more jets are preferably provided in the inlet connection leading to the digester.

The digester is made in the usual manner. The inlet connection is seen at (2), the perforated plates at (3), a false bottom at (4) and a discharge outlet at (5). The improved apparatus allows better washing out of the stock which accumulates underneath the perforated plates (3) and false bottom (4), and within the inlet connection (2).

The apparatus consists of a tube (6), which is fitted into the bottom of the digester (7) through the inlet connection (2) and through a T piece (8). The tube (6) is carried at the upper end of a hollow spindle (9), which is supported on the trunnions (10) and (11) and by a fixed bracket (12), which carries the lower trunnion (11). The fixed bracket (12) also supports a water inlet elbow (13). The tube (6) carries a number of jets or nozzles at convenient points, and adapted to discharge a jet at an angle or at right angles to the axis of the tube. The diagram shows two jets (14) just beneath the perforated plate (3), a jet (15) being provided underneath the false bottom (4) and a jet (16) in the T-shaped piece (8).

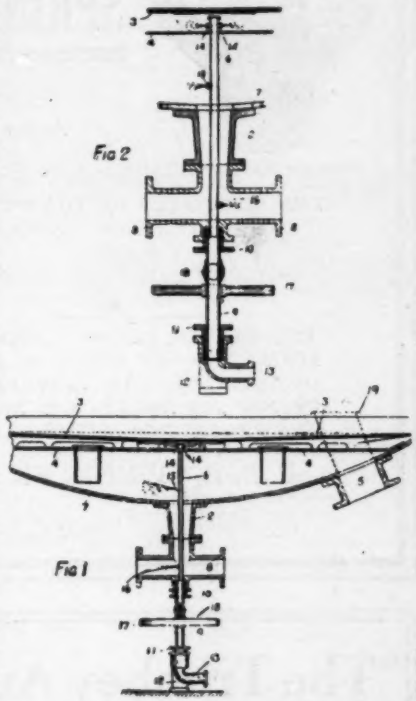


Fig 2

Fig 1

To wash out the digester it is only necessary, after the digester has been emptied of its main charge, to withdraw the usual thimble or sleeve (19) from the main discharge outlet (5) and to admit high pressure water to the inlet elbow (13). The tube (6) is then rotated by turning a handwheel (17) on the spindle (9). A master cock (18) is preferably provided on the spindle (9) to prevent any liquor from escaping while the digester is in use. The spindle (9) may be rotated mechanically instead of manually.

By the improved apparatus, the spaces in the T piece (8) and inlet connection (2) and beneath the false bottom (4) and perforated plates (3) are thoroughly cleaned and the fiber is washed into the discharge pipe (5). The fibrous material which may have collected in the T-piece (8) is floated up by the action of the jet (16) into the space between the bottoms (4) and (7), from whence it is discharged by the action of the jet (15).

Hardening Cardboard Surface

WHEN paper pulp is used in making building board, one of the difficulties that is encountered is to render the surface of the pulp product hard enough to withstand mechanical influences. For this purpose, several layers of cardboard are joined together with the aid of proper gluing preparations and then a layer of oil is applied over the external surface. But the building board that is made in this manner does not possess the requisite degree of resistance to deformation or of durability that such a product should possess.

In the new process, which is patented in French Patent No. 571,625, a cardboard which has the hardness of bone, is

AUTOMATIC SPRINKLERS

100 Per Cent Perfect

Approved by

THE ASSOCIATED FACTORY MUTUAL FIRE INSURANCE COMPANIES and the UNDERWRITERS' LABORATORIES, CHICAGO

YOU SHOULD CARRY A STOCK OF SPRINKLERS ON HAND. IF A FIRE OCCURS YOU CAN REPLACE THE OPENED SPRINKLERS AND RESTORE THE PROTECTION WITHOUT DELAY

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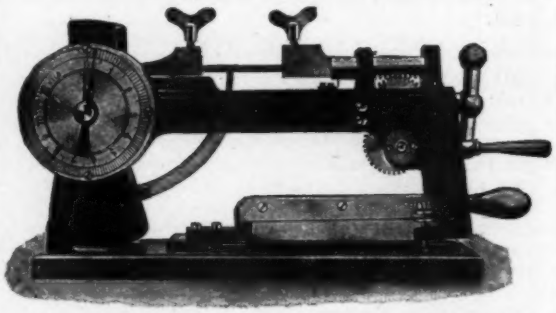

A portable instrument for testing breaking strength and stretch of paper. This tester is packed in a neat plush lined case and weighs less than ten pounds.

All Poller Instruments are guaranteed for accuracy and reliability. No springs are used, only gears and screws, which insures uniform tests at all times.

Literature describing Poller scales, testers and micrometers will be gladly sent on request. Or send us samples of paper you wish tested and we will make a trial test for you.

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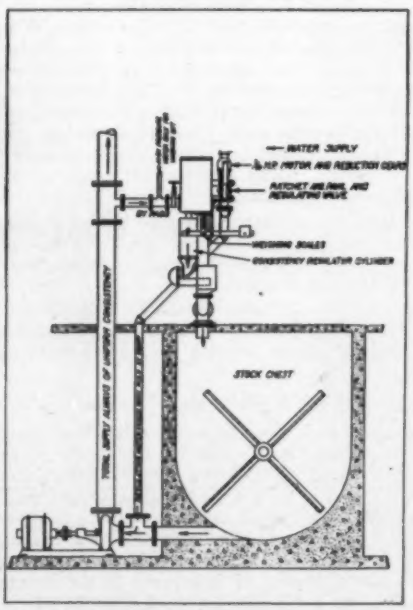
PAPER & TWINE

210 Walnut St. Cincinnati, Ohio

The Trimbey Automatic Consistency Regulator

(Patented)



Not only the FIRST but the ONLY device on the market which will control the Consistency of Paper Stock as it is being pumped.

Acts as a continuous Sampler and by adding water at the pump controls the entire volume being handled.

345 of these machines are now in use in the United States, Canada, Newfoundland and in seven Foreign Countries.

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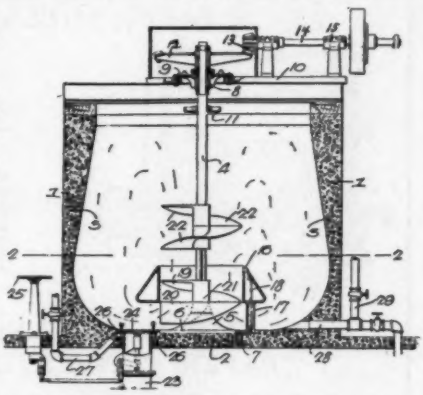
manufactured. This product can be used with advantage as a substitute for wood in building construction. The process consists in treating the individual layers of fibrous matter which compose the sheet of board with an oil under pressure. For this purpose there is employed a double boiled linseed oil or an oil varnish. The special mode of treatment ensures that the liquid penetrates completely throughout the fibrous substance so that a uniformly hard product is obtained.

After impregnation, the board is dried in air, which results in the resinification of the oil, resulting in a very hard and strong product.

Apparatus for Treating Paper

THE APPARATUS which is shown in the accompanying illustration, and which is patented in United States Patent No. 1,524,605, is used for treating paper.



This apparatus consists of a tub, a cylindrical midfeather, which is located near the bottom of the tub. This midfeather has an extended base and a vertical shaft, which passes through it. This shaft is provided with a worm and means for driving, so that the stock is made to flow downwards through the midfeather.

Suction Rolls with Suction Cells

UP TO the present time, it has been customary to provide a covering for the suction rolls which are employed on the paper making machine, which covering was pervious to water and usually was made from perforated metallic sheet of some kind. However, it has been found that this covering soon becomes clogged up with fibrous and other matters, so that it becomes impossible for the air to penetrate through the openings in the metallic covering, with the result that the vacuum effect prduced within the interior of the roll and transmitted to the wet paper web has been materially reduced.

It is claimed that this difficulty is avoided by a new design of suction rolls, which is described in German Patent No. 404,279. This suction roll is provided with cells, which are completely open in the front part. The roll is therefore covered only by the wire which runs over it.

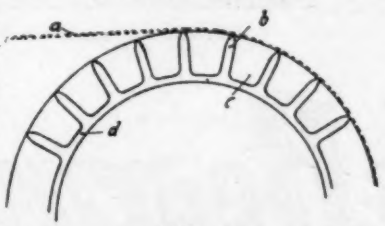
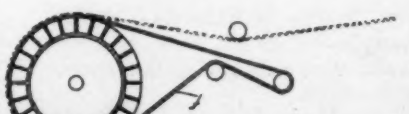


Abb. 2.

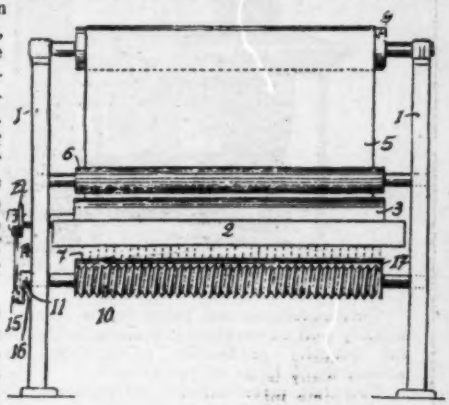
In figure 1, (a) is the wire of a Fourdrinier paper-making machine. This wire is seen to run directly over the edges of the suction roll, which is made up of a number of cells distributed equally around its circumference. The ribs of the roll are seen at (b) and between each two ribs is found a cell (c). The roll itself is represented as (d).



In figure 2, there is seen another method of using this apparatus. In this case a special felt (f) is allowed to run between the wire and the ribs of the suction roll. Thus, the paper web itself does not come in contact with this felt, but lies on the wire and the wire is in direct contact with the felt. The purpose of the felt used in this manner is just to reduce the amount of air that penetrates into the individual cells, so as to decrease the load on the pump. It is, of course, not entirely necessary to use such a felt.

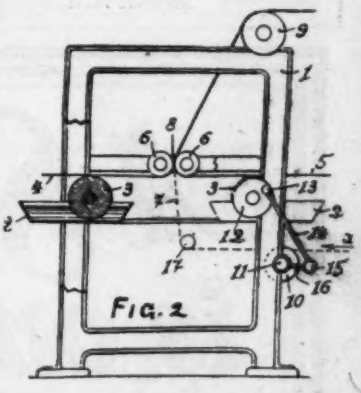
Reinforced Wrapping Paper

WRAPPING paper made by pasting together two webs of paper and enclosing reinforcing fibers or thread between the two layers is generally difficult to wind into rolls, especially when it is narrow, because of the unequal thickness of the finished paper. The succeeding layers of paper in the roll have a tendency to slip, owing to the presence of the reinforcing threads.



A recent invention overcomes this tendency by passing the reinforcing threads between the threads of a screw, which is given a suitable oscillating motion. In this manner the reinforcing threads, enclosed between two plies, form wavy instead of straight lines.

The apparatus that is employed in this process is seen in figures 1 and 2. Webs (4) and (5) pass over the gumming rolls (3), partly immersed in the troughs (2), which are filled with glue or with tar. The two sheets are pasted together by passing between rolls (6), and at this point the threads (7) come between them to reinforce the finished wrapping paper.



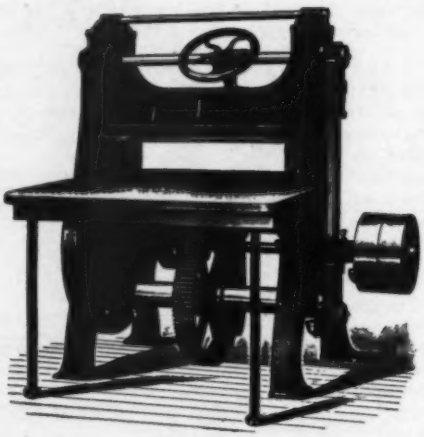
The re-inforcing threads pass between the threads of screw (10), which is driven through lever arm (16) and connecting-rod (14) from the disc (12). As the radius of point (13) is smaller than lever arm (16), rotation of point (13) causes an oscillating motion of the lever (16), and the re-inforcing threads are displaced alternately to the right and left. By using two screws and making them oscillate in opposite directions, each with one set of re-inforcing threads, there will be formed a criss-cross network.

Paper Beater

THE CHIEF improvements in the construction of a pulp beater, which has been patented recently in England and which is seen in the accompanying illustration, are the horizontal midfeather inclined in the direction opposite to the sloping bottom of the tub, and the four bedplates giving four beating surfaces in each cycle instead of one as ordinarily provided. The beater rolls are mounted on fixed journals equipped with roller bearings. The bedplates, which may be of various design to suit the stock being treated or the particular treatment desired, are capable of accurate adjustment either individually or in pairs.

In the drawing, a sectional view is taken looking in the direction of the little arrows at the ends of the section lines. The tank (1) is provided with an inclined bottom (2), which has a discharge spout (3) at its lower end, which is in turn controlled by the slide valve or gate (4). Beater rolls (5)

Kidder Die Press



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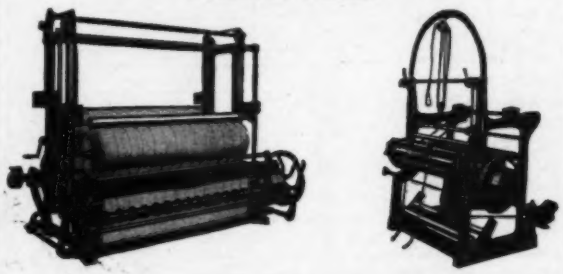

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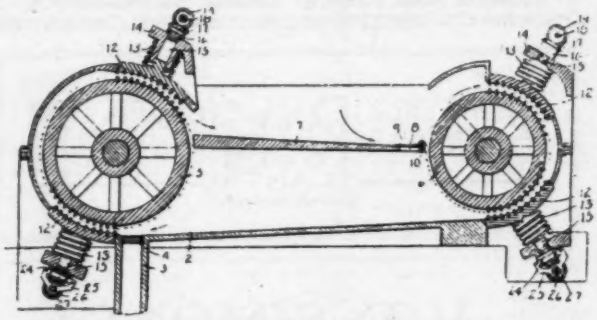
and (6) are disposed in the ends of the tank, the ends of the tank being curved so that they are concentric relative to the beater rolls, the beater roll (5), which is placed at the discharge end, being considerably larger than the beater roll (6).

Between the beater rolls is a horizontal partition or midrib (7), which is inclined in a direction opposite to that of the inclination of the inclined bottom (2) of the tank. At its lower end, the midfeather (7) is provided with a discharge



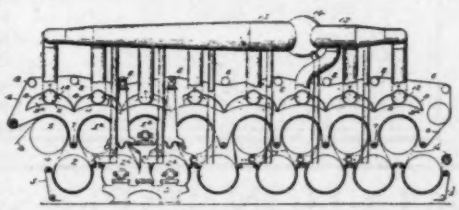
opening (8), which is controlled by the gate (9). The pivot rod (10) of this gate is extended through the wall of the tank and has an arm constituting a handle. When this valve is lifted, the flow of stock down the midfeather assists in opening it and holding it open.

The bedplates are adjustable and supported in such a manner that they yield to pressure against them. They are thus held in this fashion towards the beater rolls by means of the coiled springs (13), which are arranged between the bedplates and the cross-bars (14). The bedplates are provided with threaded arms (15), which are provided with nuts (16), which are arranged on the outer sides of the bars. This has the effect of limiting the inward movement of the bedplates under the action of the springs. The nuts are provided with bevelled pinions (17), there being several of the supporting arms for each bedplate.

Shafts (18) are provided for the purpose of simultaneously adjusting these nuts. The shafts are furnished with pinions (19) and are supported so that they can be moved rotatively and axially in bearings on the bars (14). Hand wheels are provided for manipulating the shafts when in engagement and rotated, thereby adjusting the bedplates. Coiled springs, which are arranged on one of the bearings, and a collar on the shaft hold the pinions (19) in disengaged position.

Drying Paper

THE ILLUSTRATION shows an apparatus which has been patented in United States Patent No. 1,525,483, and which is employed for drying paper. The method of drying consists in passing the paper web over a series of drying cylinders, which are an integral part of the regular paper-making machine. The moisture-laden air, as it leaves the paper web, is subjected to separate and distinct suction actions, which are applied adjacent the drying cylinders and in a common space above the cylinders.



Economical Use of Fillers

AN ARTICLE describing an economical method of using fillers has appeared in the Finnish Paper and Timber Journal. It is generally held that the loss of fillers amounts to 60 to 70 per cent in the case of gypsum, 50 to 60 per cent for heavy spar, 22 to 55 per cent for talc and china clap and 25 to 40 per cent for asbestine. These are large losses, and as fillers are comparatively vauable, the matter is of moment to the paper maker.

The Finnish method consists in adding the filler in the form of an emulsion direct to the wire. Good results are said to be obtained in this manner. The emulsion is made by methods which are commonly known; it is then screened and is then used direct on the wire. A special form of copper distributor is employed, and the size of the mouthpiece of the distributor determines the amount of filler in the finished paper.

There are no difficulties encountered with foaming and there are no irregularities in the finished paper sheet. The feed of the filler is proportioned according to the speed of the paper-making machine. The loss of filler depends upon the time during the formation of the paper web that the filler is added. The apparatus is claimed to have been tested for adding from 2 to 25 per cent filler of the weight of the paper. The loss of filler is about 7.8 per cent when the retention is 2.10 per cent and somewhat more at higher rates of retention.

Many important advantages are claimed for this process.

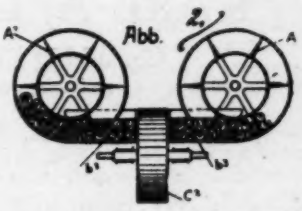
Constant Feed to Grinders

THE APPARATUS, which is patented in German Patent No. 406,640, is seen in the accompanying illustration. It describes a device for obtaining a constant feed of wood to a wood grinder.

According to figure 1, the important feature of this invention is a carrying wheel (A^1), which runs in a housing (B^1).

Abb. 1

Abb. 2



The plates (a^1), which are arranged radially around this wheel, form sections so that the housing (B^1) is divided into a number of chambers (b^1), one following right after the other. The inner walls of these chambers are formed of the cylindrical drum wheel (A^1). The chambers (b^1) take up a certain quantity of the wood and carry it along by means of the rotation of the wheel (A^1) in the direction of the arrow (x). In one part of its travel, the cylindrical housing (B^1) is built in the shape of a tangential channel (b^1), which opens out at the grinder stone (C^1). This stone rotates on the shaft (c^1).

In figure 2, there is shown an arrangement in which two of these carrying wheels are arranged symmetrically with respect to the grindstone. The two carrying wheels (A^1) carry the wood to the lateral faces of the grindstone.

Drying of Paper

IN AN article on the drying of paper, which appeared in the World's Paper Trade Review of January 9, 1925, the following suggestions are made as to how to secure economy in this operation:

1. In the first place, make sure that the regulating valve, or valves, are functioning properly; that they do not overthrow, and that their travel is cared for completely by the movement of the tension roll.
2. Eliminate all unnecessary bonds or restrictions in pipes, and have the pipes of ample size, both the supply and the return.
3. Stop leaks in valves and pipes.
4. Provide air relief in the discharge header.
5. Inspect syphon pipes or buckets regularly and keep syphons within an inch, at the maximum, from the bottom, and preferably within half an inch.
6. Keep the inside and the outside surfaces of the dryers clean at all times.
7. Provide correct ventilation for the machines, pit and machine room.
8. Head the machines closely and make sure that the vapor leaving vents is very nearly saturated, that is, the air is doing its utmost and you are not heating a large excess. Recording psychrometers placed in the vents will pay large dividends.
9. Use dry saturated steam of uniform quality.

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Write to THE PAPER INDUSTRY, 356 Monadnock Bldg., Chicago, Ill.

New York, March 2, 1925.

ACTIVITY in the paper industry is on a fairly broad scale. There is room for improvement, of course; trade in paper is in no wise approaching boom proportions at present, and yet most manufacturers and jobbers are kept moderately well engaged filling the wants of customers. Demand is of very healthy character. Consumers are purchasing paper as they see their requirements develop; little disposition is noted to order ahead unless it is known definitely that the supply contracted for will be needed; in fact, it might be said that buying is very much on a hand-to-mouth basis.

There are, however, few slack spots in the industry. Reports tell of mills running at a comparatively good rate of capacity; some are producing at full tilt and have business enough on their files to keep them fully engaged for quite a while, and a most gratifying feature of the situation is that demand is expanding steadily—nearly every change in the market in this connection being for the better. There is complaint heard among manufacturers anent the unprofitable prices at which some classes of paper are being marketed. It is a fact that producers of paper are still very hesitant to raise quotations on their product notwithstanding that manufacturing conditions seem to warrant it because they are fearful of disturbing the equilibrium of their market and of causing consumers to exert greater caution in placing orders.

The outlook is encouraging. General business is moving along at a steady and healthy pace, showing gradual improvement, and there seems every reason to expect this improvement will continue. The calamity howlers have taken a back seat, so to speak; nearly everyone in the business world is looking for bigger and better business and is making plans to take care of more business. This, of course, means a great deal for the paper industry because it is leading to an increased consumption of paper of various kinds. Reports tell of considerable activity in the printing trades, at least most of the printers in New York are fairly busy. Retail trade has been good recently and promises to expand as the spring draws nearer and the public begins to replenish its wardrobe and household. The prospects for clothing business are excellent this spring, according to factors in the apparel trade, and it is stated that retail merchants all over the country are laying in large stocks preparatory to the buying season a little later on. This will mean greater consumption of paper in a number of avenues.

Conditions within the industry are not altogether satisfactory to manufacturers, yet it is said the situation generally is better today than it was a month ago. There has been a marked decline in cost of some raw materials. Rags have receded sharply, and waste paper is on an appreciably lower price level. Some paper and board mills which for a time found it extremely difficult to manufacture and sell their product at a profit while meeting the excessively high prices prevailing for raw material are now reported in a much more favorable position. Pulp rules firm but a good many paper manufacturers are using pulp today which they contracted for some time ago at cheaper prices than now obtain.

Production of paper in the United States during December showed a fair rate of gain compared with the preceding month, according to the monthly statistical report compiled and issued by the American Paper and Pulp Association and affiliated associations. The December output, amounting to 458,637 net tons of all grades of paper, was two per cent larger than in November, when the production totaled 445,954 tons, or 10 per cent below the October output. All grades showed an increase in December, compared with November, except paper board and tissue paper. Mills' stocks of paper at the end of the year totaled 249,516 net tons, showing a slight increase from the 235,559 tons held at the end of November. Shipments from mills in December amounted to 451,666 tons, against 447,214 tons in November.

The monthly report issued by the Department of Commerce on the box board industry shows that mills of the country produced a total of 165,248 net tons of board of all kinds during December, compared with 165,192 tons in the preceding month. Board mills operated a total of 7,434,064 inch hours in December, against 7,293,613 inch hours in November. Orders received aggregated 175,425 tons of board in December, contrasted with 168,590 tons in November, while unfilled orders at the end of the year called for 107,280 tons of board, against 92,572 tons at the end of November.

Newsprint demand is of consistent character. Publishers are taking all the supply they have coming against contracts, and frequently are coming into the market to augment stocks through spot purchases. From all indications, consumption is holding up very well. The New York newspapers are printing large issues and are leaving out advertisements almost continually, showing that publishers are placing a limit on the number of pages they will print.

Not much comment is heard regarding competition of foreign print paper. Some supply is of course being imported but it does not appear to be cutting much of a figure in the domestic market. Government statistics show that imports in December into the United States totaled 125,241 short tons, of which 108,615 tons were from Canada and 3,797 tons from Newfoundland and Labrador. Sweden contributed 5,819 tons, Norway 2,577 tons, Finland 2,052 tons, and France 1,770 tons. The average price of newsprint imported during December was $0.367 a pound.

Book paper mills are fairly busy, although there are some catering principally to the transient trade which are seeking additional business. In exceptional cases prices are being shaded but as a general thing prices are well maintained and exhibit a firm undertone. Coarse paper is moving freely and at steady quotations, both wrapping and tissue enjoying a moderately active demand.

Fine paper is selling freely. Few mills are operating at capacity but it was brought out at the convention in New York last month that fine paper plants, as a group, are working on an 80 per cent basis. Fine paper prices are firm all along the line. Demand is principally for the medium and cheaper grades yet manufacturers report a fair call for the high qualities considering the quotations named on such grades.

It has been a long time since boards have ruled so firmly as they have in the last couple of months. Despite the decline in waste paper recently, mills continue to name the same quotations on board, and indications are they are well fixed with orders. Plain chip board is quoted at $50 to $52.50 a ton delivered in New York, while filled news is quoted at $55 New York. Demand is fair and promises to expand in the very near future as paper box manufacturers go into their spring season of activity.

Companies Increase Group Insurance

Group insurance protection for employees of the Defiance Paper Co., Niagara Falls Wall Paper Co. and the Pittsburgh Wall Paper Co., three closely associated business organizations, has been increased by more than $270,000, bringing the total to nearly $500,000.

The Defiance Paper Co. and the Niagara Falls Wall Paper Co. are located in Niagara Falls, N. Y., while the Pittsburgh Wall Paper Co.'s plant is in New Brighton, Pa.

Both the original and additional insurance was issued by the Metropolitan Life Insurance Co.

W. H. Pabke has been appointed general traffic manager for Price Bros. & Co., Ltd., of Quebec.

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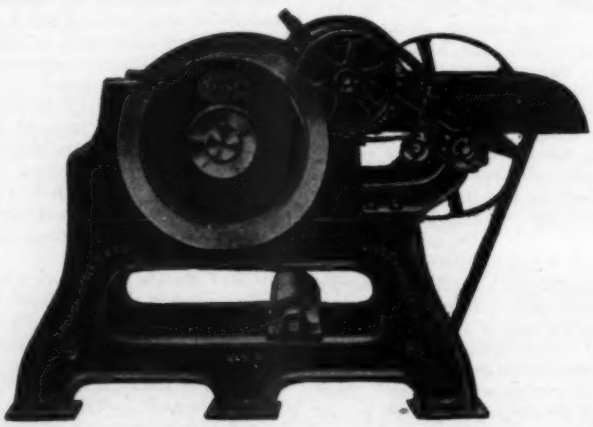

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Papermaking Rags

The market for papermaking rags has developed a very easy undertone. In fact, prices scored a precipitous decline during February, some grades now being on levels representing a drop of more than a cent per pound from the top points reached early in the year. The lower grades have suffered in the weakening of values to a larger extent than have the better qualities, which is the usual thing when demand for rags subsides, because dealers are accustomed to hold high grades while liquidating the cheaper qualities for whatever they can secure in the way of price.

Various reasons contributed to the sudden decline in rags. The principal reason was that paper manufacturers stopped buying; that is to say, they dropped out of the market for other than small lots needed to fill in stocks or required against new orders. The decline was started by a weakening of prices of roofing rags. After all, the basic strength in the market was founded on the brisk demand for this class of papermaking rags and the high prices consumers paid for such material. There hasn't been any unusual demand for the medium and higher grades of papermaking rags for some months, but the prices of such rags were automatically forced upward by the strong and advancing position of roofing stock. Therefore the moment roofing paper manufacturers let down in their buying and prices of the low grades of rags began to recede, prices of practically all other grades of old rags declined also.

In only one branch of the market is there anything resembling firmness in prices, and that is in new cuttings. Such rags are holding remarkably steady in value; in some instances further slight advances have been recorded. Production of new rags is limited, reflecting the curtailed output in clothing manufacturing establishments, and all indications would seem to point to dealers having small stocks of cuttings on hand. Moreover, paper mills are buying cuttings of most grades in a fairly consistent manner. There is nothing unusual about the volume of demand, but consumers, nevertheless, are ordering supplies freely as their requirements develop, which, in conjunction with the low production of these rags, is serving to keep prices firm.

It is difficult to say at what level the market for roofing rags and the other grades of old cottons will ultimately settle. The trend is still downward; there has been nothing in the last few days to show that the decline has been checked, and present indications are that prices will move lower. Consumers let down in their buying a month or so ago when they discovered supplies pouring in to them against back orders, especially imported rags, and when they considered it a favorable time to curtail purchases because of the approach of spring, which season is invariably the time of the year rag collections are the largest. However, there are dangerous possibilities in the rag situation—from the point of view of the consumer. When all is said, it must be acknowledged that the outlook over the present year as regards available supplies of rags for paper mills is not altogether favorable. Imports into the United States last year exceeded all previous records, totaling something like half a billion pounds of papermaking rags. This means that Europe has been fairly well drained of rags for a time and that buyers will have to depend on fresh accumulations to fill their future wants. Also, this has been a fairly open winter and it is likely collections throughout the United States have kept up better than on an average, particularly since prices of rags have been so high that collectors have been given plenty of inducement to scour the cities and country for rags.

If consumption of papermaking rags, and this is stated as applying especially to roofing mill grades, is as large this year as in 1924 it would not be at all surprising to see prices soar to just as high levels as prevailed last year, if not higher, because the probabilities are available supplies both in this country and at European sources are not going to be as large this year. It might be said that everything depends on the amounts of rags mills will need. If the demand is smaller than last year there should be no violent advance in values; if, on the other hand, demand calls for as many rags as paper mills bought and consumed in the last half of 1924, there is every reason to expect prices will recover and reach new high levels.

Roofing rags of No. 1 grade are quoted at about 2.40 cents a pound f. o. b. dealers' shipping points, and No. 2 packing at 2.20 cents. Old whites have eased off to around 7.25 cents a pound for No. 1 repacked and 5 cents for No. 2 repacked. Repacked thirds and blues are quoted at 4 cents at shipping points, and rough blues at 3.35 cents. Dealers in general ask 15.50 cents a pound or higher for No. 1 white shirt cuttings, while 10.50 cents is quoted on fancy shirt cuttings, and 14.50 cents on unbleached muslins. New khaki cuttings are very firm in price at around 7.25 cents, and washables are quoted at 9 cents and blue overall cuttings at 11.75 cents.

Foreign dark colored cottons are quoted at 2.40 cents ex dock New York for spot lots, while these rags for forward shipment from abroad have been sold at 2.30 cents. Foreign blue cottons are quiet and slightly lower in price, while light prints have moved off in value.

Average quotations f. o. b. shipping points and ex dock New York are as follows:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	15.50-16.00
White shirt cuttings, No. 2	11.00-11.50
Fancy shirt cuttings	10.50-10.75
Washables, No. 1	9.00- 9.25
Unbleached muslins	14.25-14.75
White lawns	13.75-14.25
Overall cuttings, blue	11.50-12.00
Black silesias	6.25- 6.50
Light flannelettes	12.50-13.00
Canton flannels, bleached	13.50-13.75
Canton flannels, unbleached	12.25-12.50
Shoe cuttings, bleached	13.00-13.50
Shoe cuttings, unbleached	12.00-12.50
Light silesias	11.75-12.00
O. D. khaki cuttings	7.25- 7.50
Mixed khaki cuttings	6.50- 6.75
Corduroy cuttings	6.00- 6.25
Cottonade cuttings	5.25- 5.50
Linens, No. 1 white, foreign	17.00-18.00
Light prints, foreign	7.75- 8.00
Old Stock—	
Whites, No. 1, repacked	7.00- 8.00
Whites, No. 2, repacked	4.75- 5.25
Whites, house soiled	3.75- 4.00
Whites, street soiled	3.50- 3.75
Lace curtains	5.75- 6.00
Thirds and blues, rough	3.25- 3.50
Thirds and blues, repacked	3.75- 4.00
Black stockings	4.75- 5.00
Cotton canvas, No. 1	5.75- 6.25
White cotton batting	4.75- 5.00
Roofing, No. 1	2.35- 2.50
Roofing, No. 2	2.15- 2.25
Dark colored cottons, foreign	2.35- 2.50
Blue linens, foreign	5.50- 6.00
Gray linens, foreign	6.00- 6.50
White linens, foreign	10.50-11.50
Light prints, extra, foreign	4.25- 4.50

Rope and Bagging

Of all the various waste materials consumed by paper mills,

JOSEPH GATTI President and Treasurer

GATTI Paper Stock Corporation

Formerly with the Gatti-McQuade Co.

Paper Manufacturers' Supplies

COTTON AND WOOLEN WASTE

All Grades of Rags and Paper Stock, New Wrapping Paper, Box Board and Cordage

Main Office
41 East 42nd St., New York
Liggett Bldg.

Packing House
13th and Monroe Sts.
Hoboken, N. J.

Established 1903 Wm. J. McGarity, Prop.

Penn Paper and Stock Co.

Wholesale packers and distributors of all the assortments of waste paper. Capacity 150 tons daily.

Main Office and Packing House

240 North Front St. PHILADELPHIA, PA.

EASTERN MANUFACTURING COMPANY

BLEACHED SULPHITE

Made from spruce grown in the forests of Northern Maine.

Send for Samples.

EASTERN MANUFACTURING CO.
292 Madison Avenue NEW YORK

Quality First
—and Always

ALKALI

There is no need for specifications when you order Diamond Alkalies—The quality is guaranteed—Diamond Soda Ash over 99% pure—Diamond Caustic Soda over 98% pure.

Manufactured and Sold Direct to Consumer by

DIAMOND ALKALI COMPANY
PITTSBURGH, PA.

old rope is in about the strongest market position. This commodity is moving freely into consumption. Dealers report demand arising in persistent fashion and say they are experiencing some difficulty in locating all the old rope desired. If anything, the market tone is firmer than it was several weeks ago. Seven cents per pound f. o. b. shipping points is reported readily obtained for No. 1 domestic old manila rope, and it is possible that consumers have paid above this price in some instances. Foreign old rope is bringing 6.50 to 6.75 cents ex dock New York and is selling freely, although consumers show preference for the domestic article. Strings are firm, and mixed strings have sold at 2 cents a pound and higher, f. o. b. dealers' points.

Old bagging is fairly steady in price and in demand. Roofing bagging has eased in price to where sales at around 1.80 cents a pound at shipping points have been noted, but dealers continue to quote 2.60 cents or thereabouts for No. 1 scrap bagging. Gunny is a little lower, due to a subsiding of mill demand.

F. o. b. shipping point and ex dock New York quotations follow:

	New York and Chicago
Gunny, No. 1 domestic	2.85-3.00
Gunny, No. 1 foreign	2.75-2.90
Scrap bagging, No. 1	2.60-2.75
Roofing bagging	1.80-2.00
Wool tares, heavy	2.75-3.00
Wool tares, light	2.65-2.85
Manila rope, No. 1 foreign	6.50-6.75
Manila rope, No. 1 domestic	6.75-7.00
Sisal strings	3.00-3.25
Mixed strings	1.90-2.10

Old Paper

The old paper market is weak. Prices have declined steadily for some time past, and it would appear as if the bottom has not yet been reached, even though market values have receded to levels where dealers are complaining bitterly of the lack of profit in handling the commodity, and assert they have curtailed collections to a minimum. It is rather hard to reconcile the market condition. Reports state that board mills and other plants consuming waste paper are fairly busy; certainly they must be operating on a larger scale than is indicated by their purchases of raw material, and it is puzzling to witness so small a demand for waste paper. Probably the explanation is that most paper and board mills which ordinarily use a preponderance of old paper are now running on wood pulp, and thereby are managing to keep out of the waste paper market, except in a limited way. It is quite certain that prices have declined to levels where any increase in demand will be creative of a stronger market almost immediately, particularly as regards the low grades of old paper.

Shavings are quoted at around 3.50 cents a pound f. o. b. dealers' shipping points for No. 1 hard white, and from 2.90 cents upward for No. 1 soft white shavings. Old magazines have eased to where sales of flat books have been recorded down to 1.20 cents a pound at shipping points. Ledger stock is quoted at 1.50 cents, old No. 1 kraft paper at 2 cents, and white blank news at 2 cents. Folded newspapers are selling at 60 cents a hundred pounds f. o. b. shipping points, and No. 1 mixed paper at 50 cents.

Quotations f. o. b. shipping points are as follows:

	New York and Chicago
Hard white shavings, No. 1	3.40-3.60
Hard white shavings, No. 2	3.00-3.25
Soft white shavings	2.90-3.10
Colored shavings	1.40-1.60
Heavy book, No. 1	1.20-1.35
Crumpled book, No. 1	1.00-1.10
Ledger stock	1.50-1.65
Kraft, No. 1	1.90-2.00
Manilas, No. 1	.85- .95
White blank news	1.90-2 00
Over-issue news, No. 1	.75- .80
Folded news	.60- .70
Mill wrappings	.60- .70
Mixed paper, No. 1	.50- .60
Common paper	.30- .40

Paper Stock
Now Is the Time to Buy Our Raw Materials
Out of the forty different kinds of paper stock graded in our many large warehouses, you are assured a steady, reliable source for procuring raw materials in practically every branch of paper making.
Having specialized for 35 years in this one field you can depend upon a clean, well-packed, uniform product throughout; fulfillment of delivery promises; and because of our output of 300 tons daily, big tonnage at all times.
Write us your wants and we'll gladly send further information.
Mendelson Bros. Paper Stock Co.
910 South Michigan Avenue, Chicago, Ill.
Long Distance Phones: Harrison 2940 and 5557.

A MARK OF RESPONSIBILITY ON PRODUCTS OF STANDARD QUALITY

ALUMINUM SULPHATE

The advantages of securing your standard materials from a nation-wide organization are very real. With a number of factories to draw on, the General Chemical Company can maintain delivery schedules under any circumstances.

A coast-to-coast chain of sales offices, manufacturing plants and warehouse stocks are at your service.

GENERAL CHEMICAL COMPANY

40 Rector Street, New York

Baltimore Buffalo Chicago Cleveland Easton Denver Los Angeles Philadelphia Pittsburgh Providence San Francisco St. Louis

The Nichols Chemical Co. Ltd., Montreal

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ZAREMBA EVAPORATORS

FOR

Soda Black Liquor

Sulphate Black Liquor

Sulphite Waste Liquor

Fifty large Zaremba Evaporators in the pulp mills of this country, many on repeat orders, testify to their excellence.

Consultation invited on new projects or where old installations should be rebuilt to reduce liquor losses, improve steam economy, or increase capacity.

ZAREMBA COMPANY

506 Crosby Building BUFFALO, N. Y.

"MICHIGAN" Combination Steel and Wood Pipe

LONG DISTANCE CONVEYOR OF WATER AND PAPER STOCK IN PAPER AND PULP MILLS—Specially Adapted to Carry Sulphite, Ground Wood and "White Water"

Eighteen reasons why you should use "Michigan" combination steel and wood pipe

1—Durability of Wood Shell. 2—Sanitary. 3—20% more capacity than Cast Iron Pipe. 4—Simplicity in handling. 5—Light in weight. 6—Speed in laying. 7—Protects against freezing. 8—Not affected by Electrolysis. 9—Rigid inspection of materials. 10—Efficient construction of stave. 11—Strength of steel banding. 12—Protection of banding with asphalt coating. 13—Cannot burst under pressure. 14—Can be laid in a wet trench. 15—Short curves without specials. 16—Low installation and maintenance cost. 17—Responsibility of company. 18—Not affected by sulphur or chemical solutions.

THE MICHIGAN PIPE COMPANY

Dept. 17 **BAY CITY, MICHIGAN**

New York City, N. Y.....17 East 42nd St.
Oklahoma City, Okla.....105 West 16th St.
Chicago, Ill. .....Leiter Bldg., 15 East Van Buren St.
Boston, Mass.....Room 737, Oliver Bldg.
Cleveland, Ohio.....919 Ulmer Bldg.
Chattanooga, Tenn.....702 James Bldg.
Philadelphia, Pa.....318 Widener Bldg.
Pittsburgh, Pa.....323 Fulton Bldg.

"Steel for Strength—Wood for Durability"

Chemical Pulp

A firm tone exists in the wood pulp market. Demand is good and most mills are working on a larger scale than has marked their operations in quite a while. Prices show every element of strength, and in certain cases have stiffened, so that some kinds of pulp are quoted on higher levels. As an instance of the firmness in prices, it is rumored that the leading domestic producer of bleached sulphite is preparing to advance quotations $5 a ton, which, if put into effect, will represent the first rise announced by the company in question in more than a year.

Strength and activity in domestic pulp is, of course, due in large part to the firmness of the foreign pulp markets. There is no scarcity of foreign pulps, but consumers are experiencing just enough difficulty in getting all the supply wanted to cause them to increase their buying of domestic grades. Moreover, there is a narrower price differential today, and this is working to the advantage of domestic manufacturers. Some pulp mills in the United States and Canada are reported sold up for two and three months ahead, and few have any large tonnage to offer for reasonably prompt delivery.

Bleached sulphite of No. 1 quality is quoted at 3.75 cents a pound upward, f. o. b. pulp mills, some of the special brands being held for 4.25 cents. No. 1 unbleached sulphite is quoted at 2.75 to 3 cents, and easy bleaching sulphite at 2.85 to 3 cents at mills. Kraft is selling freely at 3 cents or close to that figure for No. 1 sulphate. Prices in general display a stiffening tendency.

F. o. b. pulp mill quotations are as follows:

Bleached sulphite	3.75-4.25
Easy bleaching sulphite	2.85-3.00
Unbleached sulphite, No. 1	2.75-3.00
News grade sulphite	2.60-2.75
Soda pulp, bleached	3.50-3.75
Mithcherlich, unbleached	3.25-3.75
Kraft, No. 1	2.85-3.00
Screenings, refined	1.50-1.75

Mechanical Pulp

As predicted by a good many in the trade, prices of ground wood have advanced, and the market is characterized by pronounced strength. Two factors have led to the strengthening of the market. One has been the cold weather in most grinding districts, which has obliged manufacturers to reduce their output because of frozen mill streams and the resultant lack of an ample water supply, and the other has been that demand has continued fairly active, consumers in general having sought ground wood in sizable tonnage and having absorbed freely about all the supply that has come into the market. The transient demand has been especially good, indicating that consumers in quite a few cases have been unable to secure all the pulp wanted at usual sources of supply and therefore have had to look elsewhere to cover requirements.

Domestic producers are quoting in the vicinity of $35 a ton f. o. b. pulp mills for prime spruce ground wood. Sales up to $37 have been reported, and it is doubtful whether any appreciable supply is now available for prompt shipment at less than $35. Canadian grinders quote from $30 to $35 a ton at producing points, prices depending on the air dry test and the freight to consuming centers. Foreign ground wood of Scandinavian origin is quoted at around $38 a ton ex dock New York or other American Atlantic points, prices on the foreign article still being beyond a parity with domestic quotations in spite of the rise in the latter.

Chemicals

Papermaking chemicals display a steady price tone, with few changes of importance noted. A fairly good movement, although principally against contracts, is in progress toward consumers. Bleaching powder is quoted at 1.90 to 2 cents a pound and some producers ask above 2 cents for spot shipments. Casein is steady at around 12 cents per pound and is enjoying a moderate demand. Caustic soda is quoted at 3.10 to 3.15 cents per pound, and soda ash at 1.38 cents on a flat basis at works.

Average quotations f. o. b. works are as follows:

Alum, lump ammonia	3.25- 3.50

(Continued on page 2223)

SOLVAY
STANDARD IN SODA SINCE 1881

Soda Ash

Caustic Soda

Quality and Service Guaranteed by the largest source of supply.

Over 75 stock distributing points assure prompt shipment with minimum transportation charges.

The Solvay Process Co.

SYRACUSE, N. Y.
DETROIT, MICH.
HUTCHINSON, KAN.

WING & EVANS, Inc., Sales Department
40 Rector Street, New York

Boston Cincinnati Cleveland
Detroit Pittsburgh Chicago
Syracuse Indianapolis

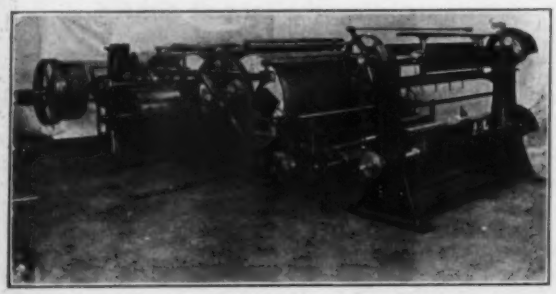
INTERNATIONAL

The Modern Executive

Times have changed. Business executives now arrange their working days to leave time for the big jobs.

How do they do it? Well, for instance, users of International Salt do not spend time worrying about quality or deliveries. They know that the exceptional facilities of the International organization insure absolute purification; that the reputation of this firm for fair dealing promotes cordial and frictionless relations.

INTERNATIONAL SALT COMPANY, Inc.
SCRANTON, PENNSYLVANIA
NEW YORK OFFICE: 2 RECTOR STREET



Latest Type Crepe Machine

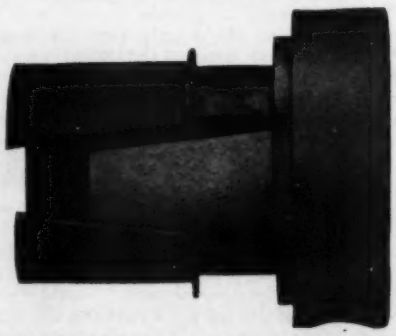
Dryer 48″ diameter by 84″ face.

Same machine can be built in any desired width and with any number of dryers. This machine is equipped with Drum Winder and Double Automatic Collapsing Reel.

Hudson-Sharp Machine Co.
Green Bay, Wis.

Selling Agents:
Gibbs-Brower Co., 261 Broadway, N. Y. C.;
100 Jackson Blvd., Chicago

THE ONEIDA CHUCK for use with Paper or Strawboard Cores



This chuck is so designed that it cannot split or damage the paper core on which the paper is wound and allows the roll to be run down to the last thickness of paper.

The conical or wedge-shaped chucks now commonly used with paper cores invariably split the paper cores so that from ½″ to 1″ of paper next to the core is damaged. The elimination of this waste will soon pay for the equipment on each machine.

Our Chuck allows the use of a cheap non-returnable paper core that once used can be thrown with the waste and sold.

Let us make up a trial set for you

ONEIDA CHUCK COMPANY
RHINELANDER, WISCONSIN

New Papers

Writing—	
White rag	22-45
White sulphite	11-30
Colored rag	17-40
Ledger—	
White rag	22-50
White sulphite	13-30
Colored sulphite	40-30
Colored rag	17-50
Bonds—	
White rag	20-45
White sulphite	10-30
Colored sulphite	10-30
Colored rag	17-50
Book—	
No. 1 S. & S. C.	6.50- 7.25
Machine finished	6.25- 7.00
English finished	6.50- 7.25
Coated and enameled	8.25-14.00
Lithographed, M. F.	9.00-15.00
Newsprint—	
Rolls, contract	3.50- ....
Rolls, transient	3.65- ....
Sheets	4.00- 4.25
Side runs	3.00- 3.25
Cover Stock—	
Coated, both sides	10.25
Coated, one side	10.15
Tissue—	
No. 1 white, 20x30	.75- .85
No. 2 white, 24x36	.70- .75
No. 1 manila, 24x36	.70- .75
Kraft	.90- 1.00
Wrapping—	
No. 1 Kraft	5.50- 6.25
No. 2 Kraft	5.00- 5.50
Boards—	New York and Chicago
Solid news	55.00-60.00
Straw	50.00-55.00
Plain chip	50.00-55.00
White coated chip	65.00-70.00
Manila coated chip	55.00-60.00
Binder's board	70.00-75.00

Chemicals

(Continued from page 2221)

Alum, lump starch	3.75- 4.00
Blanc fixe, powder	3.75- 4.00
Bleaching powder	1.90- 2.10
Brimstone (long ton, at mine)	18.00-20.00
Casein (duty paid)	11.50-12.50
Caustic soda, spot delivery	3.10- 3.15
China clay, domestic washed	12.00-16.00
China clay, foreign	15.00-20.00
Rosin, grade E	6.15
Satin white	2.00- 2.25
Soda ash, 58 per cent light (bags)	1.38
Starch, papermakers', in bags	3.40- 3.70
Talc (ton)	16.00-17.00

New Catalogs, Booklets, Etc.

S. F. Bowser & Co., Inc., Fort Wayne, Ind.—"Representative Power Plants" is the title of booklet containing the illustrations of a number of America's large power plants in which Richardson-Phenix turbine oil purification systems, made by Bowser, have been installed. Descriptive information regarding the system is also included.

Elliott Company, Pittsburgh, Pa.—"Kerr Turbines for Generator Drive" is a handsomely prepared booklet illustrating and describing in a general way the principal features of design and construction of Kerr turbines for generator drive, reduction gears, some special applications and a few representative installations.

Taber Pump Company, Buffalo, N. Y.—A new bulletin, No. 120-A, contains interesting information and illustrations of sump pumps and vertical centrifugal pumps for a variety of purposes. It also contains a skeleton of specifications for sump pump equipment as well as rating tables.

Riley Stoker Corporation, 9 Neponset St., Worcester, Mass.—"A Type for Every Stoker Need" is an illustrated booklet showing the various types of mechanical stokers which go to make up the complete line of this company. They are shown as the result of 47 years of accumulated experience derived from the installation of their equipment under a total of approximately 3,000,000 rated horsepower of boilers.

The Poole Engineering and Machine Co., Baltimore, Md.—Two new types of reduction gears are shown and described in Bulletins 105 and 106. Type K (106) reduction gear is totally enclosed herringbone spur gear drive in which the driving pinion is located in the top of a cast iron casing and the driven shaft is immediately under and parallel to it, which locates the driven shaft very close to the floor line. Type H (105) transformer consists of a double helical or herringbone gear and a herringbone pinion, cut integral with the high speed shaft.

National Safety Council, 168 N. Michigan Ave., Chicago—"Teaching Safety to New Employees" is an illustrated safe practice pamphlet which has just been published. It is non-technical in reading matter and is the combined experience of the industrial members of the Council. It is edited by 75 safety engineers, a volunteer committee for such work.

Link-Belt Company, 910 S. Michigan Ave., Chicago—The many uses to which the skip hoist method of handling materials may be effectively applied are interestingly set forth in the text matter and illustrations of a new book just issued by this company.

Nuway Boiler and Engineering Co., 53 W. Jackson Blvd., Chicago—"Treatise on Boiler Water Circulation" is an interesting eight-page pamphlet dealing with the principles of boiler circulation. This treatise discusses the importance of rapid circulation of boiler water, together with twelve reasons why rapid circulation is so important as a means of preventing priming, foaming, wet steam, etc.

Revised Statistical Abstract

The Statistical Abstract for 1923 has been released by the Department of Commerce. This is the official American handbook of statistics. It includes in condensed form all the important statistics about the United States, its government, its people and their business. The book has been thoroughly revised this year. It contains practically 50 per cent more data than heretofore, but by various methods of condensation has been kept within practically the same number of pages. The additional material relates very largely to industry and commerce. The tables have also been arranged more clearly and conveniently and certain changes in order made which bring together all data relating to a given industry or commodity, thus facilitating use by the business man.

Copies may be obtained by application to the Superintendent of Documents, Government Printing Office, Washington, D. C., or through any of the district or co-operative offices of the Bureau of Foreign and Domestic Commerce. Price, 85c.

The B Co. DIC. QUALITY PULPS

HAFSLUND NORWAY — **"HAFSLUND BEAR"** Bleached Sulphite

F: HAGA — **"FORSHAGA"** Bleached Sulphite

KRAFT HURUM NORWAY SPECIAL — **"HURUM SPECIAL"** Extra Strong Kraft

KOOS BAC — **"BAMBLE"** Extra Strong Kraft

The Borregaard Company
200 Fifth Ave. Incorporated New York, N.Y.

BATHURST LUMBER COMPANY, LIMITED

PRICE & PIERCE, LTD.
17 East 42nd Street, NEW YORK CITY

ARE NOW THE

SELLING AGENTS
for Bathurst Pulp in the United States

Unbleached Sulphite 50 tons daily
Kraft Pulp 50 tons daily

Our pulp is made from Canadian Spruce
We ship in sheets, baled

BATHURST, NEW BRUNSWICK, CANADA

Bleached and Unbleached
SULPHITES
KRAFT PULPS

Foreign and Domestic
GROUND WOOD

PERKINS-GOODWIN CO.
NEW YORK
33 West 42nd St.

PAPER
PRINTING PAPER
OF
EVERY DESCRIPTION

EXPORTS

Exports of paper from the United States during the calendar year of 1924 showed but comparatively small change, in point of value, from the preceding year, according to statistics issued by the Department of Commerce in Washington. Total exports of paper of all kinds from this country last year were valued at $24,578,872, representing a loss of a little more than a million dollars from the export shipments in 1923, which were valued at $25,682,749.

Exports of newsprint paper in 1924 amounted to 34,317,278 pounds, valued at $1,773,187, contrasted with 32,714,732 pounds, of a value of $1,636,937, in 1923, showing a moderate increase in both tonnage and value. The bulk of our newsprint exports last year was to Cuba, shipments to that country totaling 18,420,438 pounds, or more than half of the total exports from the United States.

Exports of book paper, not coated, from this country in 1924 amounted to 18,581,795 pounds, valued at $2,078,589, against 26,597,921 pounds, of a value of $3,001,149, in 1923, showing a considerable decline. Exports of kraft wrapping paper last year reached a total of 638,588 pounds, valued at $72,600, compared with 873,373 pounds, of a value of $79,737, in 1923, while exports of other wrapping paper amounted to 24,420,296 pounds, valued at $1,968,267, against 25,873,856 pounds, of a value of $2,096,640, in 1923.

Paper board exports from the United States recorded a big gain in 1924, totaling 71,135,903 pounds, valued at $2,770,948, compared with 56,294,479 pounds, of a value of $2,678,145, in the preceding year. Exports of building and sheathing paper also increased, reaching a total of 7,149,598 pounds, of a value of $344,976, in 1924, against 3,767,627 pounds, of a value of $179,884, in 1923.

Writing paper exports from this country last year amounted to 4,371,695 pounds, valued at $702,967, contrasted with 6,208,162 pounds, of a value of $1,045,911, in 1923. Tissue and crepe paper exports for the year totaled 2,980,456 pounds, valued at $794,861, against 3,375,634 pounds, of a value of $846,808, in 1923.

IMPORTS

Wood Pulp

The foreign pulp markets are very firm. Offerings to the United States, according to authentic advices, are much more limited both as regards number and tonnage than in a long time. Mills in Scandinavia and in other parts of Europe seem well sold ahead and are not over-anxious about making further commitments except on a rather small scale, and it is not an easy matter for importers in New York to locate all the supply of pulp desired at present, particularly those mill brands best known and chiefly wanted in this country. Prices display a strong upward tendency. In fact, market levels are on a higher level than they were and it would appear as if further advancement might be recorded. Conditions at primary sources are firm unmistakably, and are making for a stronger market in the United States.

The danger of a general tie-up of the paper and pulp manufacturing industry in Sweden has not yet been averted. As a matter of fact it appears quite probable that the threatened lockout in the paper mills of Sweden will go into effect. March 16 has been set as the date for the lockout, which has been postponed several times to permit the Government labor mediation committee to endeavor to smooth over the trouble and bring the manufacturers and their employes to an agreement. If the difficulty is not patched up the lockout will be declared in the paper mills, and it is stated that it is more than likely the trouble will spread to the pulp plants, thereby bringing production of pulp in Sweden to a standstill. If this comes about the effect on the world's pulp markets, and especially on the market in the United States, will be tremendous because of the fact that Sweden has been supplying the world with a large part of its pulp and because consumers in America and elsewhere have big amounts of pulp bought on contract from the Swedish mills.

Pulp imports into the United States in December showed a gain over the November receipts, amounting to 118,856 net tons of chemical pulp, compared with 97,574 tons in November, and 26,096 tons of ground wood, against 22,174 tons in November. A total of 1,142,123 net tons of chemical pulp of all kinds was imported into the United States in 1924. Perhaps this established a new high record of pulp inportations. Last year's receipts were appreciably larger than the 967,869 tons imported in 1923, and the monthly average of imports in 1924 jumped to 95,176 net tons from 80,655 tons during 1923. Total imports of mechanical pulp into this country last year were 219,564 net tons, contrasted with 267,924 tons in 1923.

Importers ask 2.90 to 3 cents a pound ex dock New York or other American Atlantic ports for prime Swedish kraft pulp, and some quotations range above 3 cents. Kraft is in a very strong market position. There is little supply on the spot unsold in this country, and Scandinavian mills are well sold up and are not keen about taking additional orders. Bleached sulphite of prime quality is quoted at 3.75 cents per pound upward on the dock, some brands being held for 4 cents and higher. Strong unbleached sulphite is quoted around 2.85 cents ex dock New York, and easy bleaching sulphite at 3 cents. Ordinary unbleached Mitscherlich is held for 2.80 cents ex dock, and genuine Mitscherlich at 3 to 3.25 cents. Imported ground wood is quoted at about $38 per ton ex dock New York.

Receipts at the port of New York in February and current market quotations ex dock New York follow:

Bleached sulphite, No. 1	3.75- 4.25
Unbleached sulphite, strong, No. 1	2.80- 3.00
Unbleached sulphite, No. 2	2.60- 2.80
Easy bleaching sulphite	2.90- 3.15
Mitscherlich unbleached, genuine	3.00- 3.25
Mitscherlich unbleached, ordinary	2.80- 3.00
Kraft, standard Swedish	2.90- 3.00
Ground wood, per ton	37.00-38.00

Atterbury & McKelvey, 300 bls. from Moss; J. Andersen & Co., 5,279 bls. from Greaker and 624 from Hamburg; Central Union Trust Co., 2,285 bls. from Greaker; International Acceptance Bank, 2,617 bls. from Rotterdam; M. Gottesman & Co., 4,000 bls. from Sebenico; E. M. Sergeant Co., 1,100 bls. from Oslo and 5,176 from Gothenburg; Castle & Overton, 1,035 bls. from Hamburg; E. J. Keller Co., 1,600 bls. from Hamburg; Equitable Trust Co., 1,188 bls. from Hamburg and 1,672 from Bremen; Ira L. Beebe & Co., 3,175 bls. from Hamburg; Lagerloef Trading Co., 589 bls. from Hamburg and 525 from Bremen; National City Bank, 330 bls. from Hamburg; Bulkley, Dunton & Co., 600 bls. from Copenhagen and 3,575 from Sweden; Scandinavian Pulp Agency, 305 bls. from Copenhagen; Mechanics & Metals National Bank, 1,000 bls. from Oslo; Parsons & Whittemore, 200 bls. from Gothenburg; Price & Pierce, 2,400 bls. from Gothenburg; Industrial Fiver Corp., 625 bls. from Gothenburg; Hartig Pulp Co., 1,250 bls. from Hamburg; Tidewater Paper Mills Co., 24,216 bls. from Liverpool, N. S.; Nilsen, Lyon & Co., 4,500 bls. from Oslo; Kidder, Peabody Acceptance Corp., 250 bls. from Oslo; Merchants National Bank, 250 bls. from Greaker; Pagel, Horton & Co., 12,750 bls. from Sweden; Goldman, Sachs & Co., 700

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Paper Makers Chemical Company

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Magazines, books, old paper and boxboard, frozen or dried pulp laps run through the Mitts & Merrill Gravity Feed Shredder are reduced to particles which hydrate readily when put into the beaters.

Built in six sizes with spouts ranging from 18" to 45" wide

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Because shredding in the Mitts & Merrill Gravity Feed Shredder expedites hydration in the beaters there is considerable saving made in power. Thus we see that the shredder here illustrated reduces costs while it is reducing paper stock.

We will be glad to furnish details upon request.

We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse

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bls. from Hamburg; American Exchange National Bank, 160 bls. from Oslo; Buck, Kaier & Co., 800 bls. from Sweden; Johaneson, Wales & Sparre, 500 bls. from Sweden; Order, 1,740 bls. from Oslo, 1,946 Kotka, 449 Raumo, 450 Copenhagen, 1,775 Greaker and 870 from Trieste.

Paper Stock

Imports of papermaking rags into the United States in 1924 were very heavy, totaling 507,263,043 pounds, according to Government statistics, which probably established a new high record, being 110,000,000 pounds larger than in 1923. Imports of papermaking raw materials other than wood pulp continued large during February, judging from manifests of steamers arriving at the port of New York in that month. Large shipments of rags were received, and proportionately big lots of old rope, bagging and waste paper came in. Imports of all kinds of papermaking stock through the port of New York in February, with names of consignees, were as follows:

Old Rope

Brown Bros. & Co., 166 bls. and 60 coils from Rotterdam, 363 bls. Antwerp, 40 coils Oslo, 217 bls. and 10 coils Liverpool, 505 coils Bristol, 228 coils and 62 bls. London, and 85 coils Hamburg; E. J. Keller Co., 28 bls. from Antwerp, 106 bls. Bremen, 109 coils Marseilles and 38 coils Rotterdam; Ellerman's Wilson Line, 51 coils London; U. S. Mortgage & Trust Co., 85 bls. from Rotterdam; W. Schall & Co., 33 coils from Hamburg; W. R. Grace & Co., 60 bls. from Barcelona; Salomon Bros. & Co., 131 coils from Marseilles; Bank of New York & Trust Co., 51 bls. from Copenhagen, Order, 45 bls. and 7 coils from Bremen, 45 bls. and 19 coils Liverpool, 177 bls. and 348 coils Copenhagen and 107 coils and 8 bls. Hamburg.

Old Bagging

Castle & Overton, 137 bls. from Antwerp and 233 Rotterdam; W. Schall & Co., 100 bls. from Antwerp; E. J. Keller Co., 209 bls. from St. Nazaire, 306 Antwerp, 111 Barcelona, 222 Hamburg, 326 Rotterdam, 26 Genos, 66 Algiers and 92 Copenhagen; British Bank of South America, 106 bls. from Liverpool and 225 Manchester; E. Butterworth & Co., 187 bls. from Antwerp and 43 Rotterdam; Mechanics & Metals National Bank, 109 bls. from Antwerp, 273 Marseilles and 25 Manchester; Brown Bros. & Co., 229 bls. from Antwerp; Equitable Trust Co., 81 bls. from Manchester and 129 Barcelona; Anglo-South American Trust Co., 71 bls. from Manchester; Atlantic Exchange Bank & Trust Co., 46 bls. from Marseilles; J. B. Moss & Co., 58 bls. from London; Bank of New York & Trust Co., 113 bls. from Barcelona; New York Trust Co., 119 bls. from Barcelona; William Steck & Co., 80 bls. from Rotterdam; H. S. Prince, 73 bls. from Liverpool; George M. Graves Co., 28 bls. from Genoa; Order, 128 bls. from Bombay, 148 Bristol, 91 Marseilles, 104 Genoa, 79 Glasgow, 16 Liverpool, 99 Hamburg and 60 London.

Rags

Stone Bros. Co., 428 bls. from Antwerp, 158 Havre, 68 Dunkirk, 53 Rotterdam and 181 Barcelona; E. Butterworth & Co., 53 bls. from Marseilles and 82 Barcelona; Castle & Overton, 47 bls. from Antwerp, 46 Rotterdam, 55 Bremen, 284 Dunkirk and 35 Leghorn; E. J. Keller Co., 174 bls. from Hamburg, 400 Trieste, 438 Marseilles, 2,335 Rotterdam, 201 Dunkirk, 379 Bordeaux, 209 St. Nazaire, 200 Kobe, 1,486 Antwerp, 26 Genoa, 220 Havre, 196 Amsterdam, 230 Barcelona, 140 London, 410 Algiers and 550 Kobe; George M. Graves Co., 245 bls. from Rotterdam; Daniel M. Hicks, Inc., 234 bls. from Rotterdam and 161 Havre; S. Silberman Co., 60 bls. from Rotterdam and 31 Marseilles; Paul Berlowitz, 82 bls. from Rotterdam and 123 Havre; Atlas Waste Mfg. Co., 92 bls. from Rotterdam and 102 Havre; Leshner Paper Stock Co., 251 bls. from Havre and 29 Rotterdam; Victor Galaup, Inc., 148 bls. from Havre, 146 Marseilles and 28 Leghorn; Atterbury Bros., 5 bls. from Havre and 42 Leghorn; R. Bishop Mfg. Co., 361 bls. from Dunkirk; J. J. Patricof, 230 bls. from Rotterdam; Robert Blank, 129 bls. from Rotterdam, 330 Bremen and 17 Marseilles; American Wool Stock Co., 142 bls. from Rotterdam and 112 [illegible]en; S. Birkenstein & Sons, 363 bls. from Rotterdam, 47 Bremen and 595 Antwerp; Atterbury & McKelley, 51 bls. from Havre and 28 Dunkirk; Salomon Bros. &

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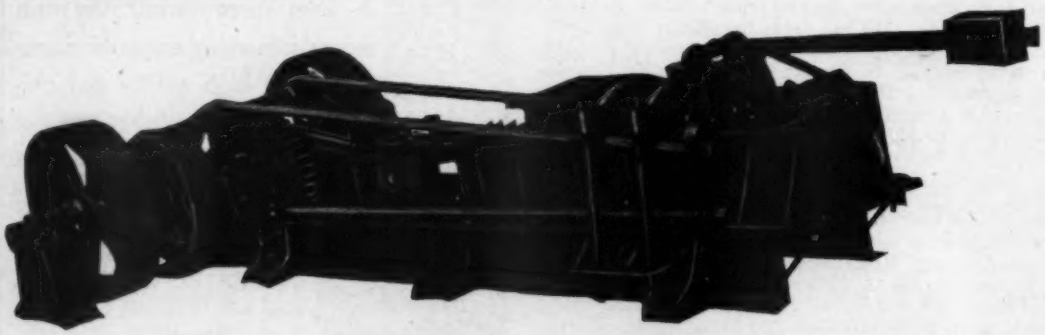

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Miscellaneous Paper Stock

Anglo-South American Trust Co., 103 bls. from Antwerp, 275 Rotterdam and 72 Cardiff; E. Butterworth & Co., 110 bls. from Rotterdam, 51 Londonderry and 10 London; Ignasio, Abela & Co., 80 bls. from Malta; Katzenstein & Keene, 41 bls. from Cardiff and 45 Avonmouth; Maurice O'Meara Co., 23 bls. from Dundee; Castle & Overton, 33 bls. from Dundee; National City Bank, 150 bls. from Leith, 24 Naples and 113 Hamburg; Brown Bros. & Co., 53 bls. from Leith and 120 Glasgow; American Exchange National Bank, 89 bls. from

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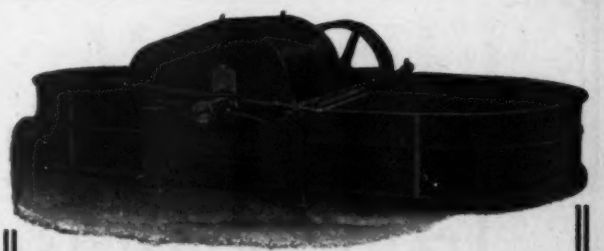

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Paper

Importations of printing and wrapping paper into the United States during February were on a fairly large scale, judging from the manifests of steamers arriving at the port of New York. Receipts of cigarette, filter, hanging and other kinds of paper also were moderately large. Imports of paper of all kinds through the port of New York during February follow, these data being taken from the manifests of vessels reaching that port during the month:

Printing

Bank of New York & Trust Co., 431 rolls from Moss; F. C. Strype, 104 cs. from Rotterdam; Bankers Trust Co., 22 cs. from Naples and 204 rolls Hamburg; B. F. Drakenfeld & Co., 92 cs. from Liverpool; Irving Bank-Columbia Trust Co., 1,490 rolls and 54 bls. from Hamburg; Perry, Ryer & Co., 98 cs. from Glasgow and 26 cs. from Rotterdam; Chemical National Bank, 102 cs. from Glasgow and 141 rolls Hamburg; American Bluefriesveem, Inc., 4 rolls and 55 bls. from Hamburg; New York & Hauseatic Corp., 41 bls. and 127 rolls from Hamburg; Schenkers, Inc., 10 cs. from Rotterdam; C. Steiner, 20 cs. from Rotterdam and 6 cs. Hamburg; P. C. Zuhlke, 227 cs. from Antwerp; W. Hartmann & Co., 574 bls. from Hamburg; Martin & Bechtold, 16 cs. from Bremen; Zellerbach Paper Co., 10 cs. from Yokohama; Import Paper Co., 26 cs. from Rotterdam; Majestic Mills Paper Co., 122 bls. from Rotterdam; J. P. Heffernan Paper Co., 901 rolls from Trieste and 16 bls. Hamburg; New York Times Co., 757 rolls from Gothenburg; M. Gottesman & Co., 216 rolls from Gothenburg; Perkins-Goodwin Co., 37 cs. from Genoa; Ault & Wiborg, 28 cs. from Hong Kong; Old Master Paper and Pulp Co., 209 rolls from Trieste; C. G. Keferstein, 131 rolls from Trieste and 385 rolls from Hamburg; Keuffel & Esser Co., 68 rolls from Hamburg; Drinkhansen & Hollkott Paper Co., 41 bls. from Hamburg; Fourth & First National Bank of Nashville, 299 rolls from Hamburg; Traders Paper Co., 426 bls. from Hamburg; P. Puttmann, 175 cs. from Antwerp; Oxford University Press, 15 cs. from Liverpool; Bank of America, 83 rolls from Hamburg; Bank of New York & Trust Co., 142 rolls from Gothenburg; Order, 178 rolls from Oslo, 318 rolls Kotka, 192 rolls Helsingfors, 13 cs. Rotterdam and 2,317 rolls and 13 cs. Hamburg.

Wrapping

International Acceptance Bank, 295 rolls and 131 bls. from Trondhjem, 23 bls. and 249 rolls from Bergen; Irving Bank-Columbia Trust Co., 63 bls. from Antwerp; F. C. Strype, 7 cs. from Antwerp; J. P. Heffernan Paper Co., 228 bls. from Hamburg and 154 bls. from Gothenburg; Judson Freight Forwarding Co., 10 cs. from Southampton; W. Schall & Co., 176 bls. from Hamburg; Fidelity International Trust Co., 11 bls. from Hamburg; Republic Bag & Paper Co., 527 bls. from Hamburg; International Forwarding Co., 2 bls. from Hamburg; Maurice O'Meara Co., 52 bls. from Rotterdam and 130 bls. Hamburg; F. Meyer, 12 rolls from Hamburg; Merchants Products Corp., 241 bls. from Bremen; Wilkinson Bros. & Co., 164 bls. from Rotterdam and 130 bls. Hamburg; Drinkhansen & Hollkott Paper Co., 111 rolls from Rotterdam; C. K. MacAlpine & Co., 1,507 rolls and 116 bls. from Gothenburg; Arkell Safety Bag Co., 808 rolls and 57 bls. from Gothenburg; Borregaard Co., 1,553 rolls and 564 bls. from Gothenburg; F. L. Kraemer & Co., 14 cs. from Antwerp; Blauvelt-Wiley Paper Mfg. Co., 79 bls. from Glasgow; Chemical National Bank, 103 rolls from Hamburg; H. Fishman Paper Co., 1,084

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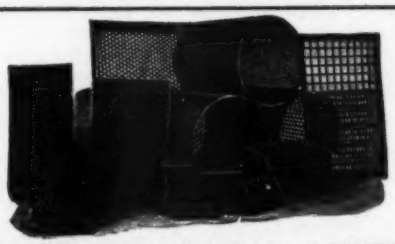

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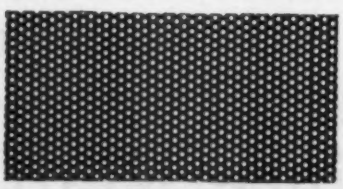
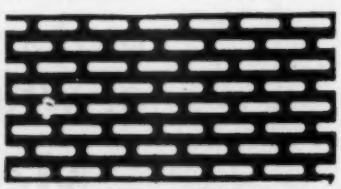
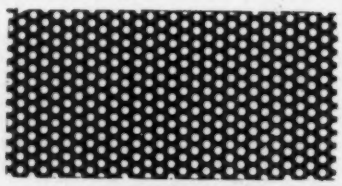


.065 inch round



⅛ x ⅜" Slots



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rolls and 42 bls. from Gothenburg; C. G. Winans Co., 547 rolls from Gothenburg; M. M. Cohan, 253 rolls and 25 bls. from Gothenburg; Thomas Barrett & Son, 25 bls. from Gothenburg; Guaranty Trust Co., 9 rolls and 87 bls. from Gothenburg; Order, 141 bls. from Hamburg and 6 cs. Antwerp.

Cigarette

Standard Products Corp., 178 cs. from Havre; R. J. Reynolds Tobacco Co., 670 cs. from St. Nazaire; American Tobacco Co., 500 cs. from Bordeaux; P. J. Schweitzer, 205 cs. from Havre; Zorro Tobacco Co., 25 cs. from Lisbon; DeManduit Paper Corp., 144 cs. from St. Nazaire; F. P. Gaskell & Co., 20 cs. from Havre; Order, 22 cs. from Barcelona and 6 cs. Havre.

Writing

Coenca-Morrison Co., 7 cs. from Southampton; A. Goodman & Co., 6 cs. from Liverpool; Guibont Freres & Co., 27 cs. from Southampton; Globe Shipping Co., 3 cs. from Southampton; Distinctive Writing Paper Co., 4 cs. from Southampton; P. Puttmann, 111 cs. from Marseilles; Marcus Ward, Inc., 7 cs. from Glasgow.

Drawing

Keuffel & Esser Co., 77 cs. and 41 rolls from Hamburg; H. Reeve Angel & Co., 7 cs. from London; E. Dietzgen & Co., 6 cs. from Rotterdam; Favor Ruhl Co., 4 cs. from London.

Filter

H. Reeve Angel & Co., 2 cs. from Southampton and 35cs. London; E. Fougera & Co., 127 cs. from Southampton; J. Manheimer, 98 bls. from Southampton; E. H. Danziger & Co., 15 cs. from Hamburg; A. Giese & Son, 59 bls. from Bordeaux; American Import Corp., 73 cs. from Bordeaux; Order, 36 cs. from Marseilles.

Tissue

F. C. Strype, 11 cs. from Liverpool; Meadows, Wye & Co., 7 cs. from Liverpool; G. W. Sheldon & Co., 7 cs. from Liverpool; Milton Snedeker Corp., 55 cs. from Helsingfors; Iwai & Co., 16 cs. from Kobe; Whitfield Paper Works, 25 cs. from Kobe; Baldwin Universal Co., 4 cs. from Liverpool; Order, 4 cs. from London.

Photo

P. C. Zuhlke, 90 cs. from Antwerp; P. Puttmann, 32 cs. from Antwerp; J. J. Gavin & Co., 4 cs. from Liverpool; Gevaert Co. of America, 93 cs. from Antwerp; Globe Shipping Co., 311 cs. from Bremen; G. Gennert, 3 cs. from Antwerp; F. Henjes, Inc., 25 cs. from Bremen.

Hanging

F. G. Prager & Co., 565 rolls from Antwerp; J. W. Hampton Jr. & Co., 732 bls. from Antwerp; F. J. Emmerich & Co., 4 bls. from Southampton; 46 bls. Liverpool, 14 bls. Hamburg, 24 bls. Havre and 17 bls. London; C. A. Haynes & Co., 210 bls. and 28 cs. from London; F. A. Binder, 5 bls. from Bremen; W. H. S. Lloyd & Co., 23 bls. from Liverpool; Drinkhansen & Hollkott Paper Co., 484 bls. from Antwerp and 288 rolls Bremen; A. C. Dodman Jr. & Co., 36 bls. from Antwerp, 4 bls. Havre and 73 bls. Liverpool; R. F. Downing & Co., 45 bls. from Kobe.

Board

Adrian Vuyck, 1,464 rolls from Rotterdam; Houbigant, Inc., 9 cs. from Havre; Gevaert Co. of America, 4 cs. from Antwerp; Draeger Shipping Co., 6 cs. from Southampton; H. H. Ayer, 9 cs. from Havre; O. M. Baxter, Inc., 48 cs. from Gothenburg; A. H. Ringk & Co., 6 cs. from Hamburg; Wilkinson Bros. & Co., 135 bls. from Hamburg; Bendix Paper Co., 25 bls. from Hamburg; Order, 4 cs. from London and 56 cs. Hamburg.

Miscellaneous

Japan Paper Co., 17 cs. from Marseilles, 1 cse. London and 7 cs. Gothenburg; Borden & Riley Paper Co., 14 cs. from Antwerp; Dupont Cellophane Co., 2 cs. from Havre; Whiting-Patterson Co., 12 cs. from Havre and 48 cs. Southampton; Guibont Freres & Co., 3 cs. from Havre; Hensel, Bruckman & Lorbacher, 8 cs. from Havre, 4 cs. Southampton, 5 cs. Bremen and 2 cs. Rotterdam.

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Will Serve Long Beyond the Span of Life Usually Allotted to Valves

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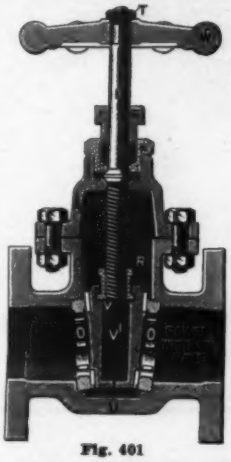

Fig. 401

Double wedge self-adjusting discs of non-corrosive White "POWELLIUM" Nickel. Outside screw stem and yoke.

Steam working pressure up to 250 pounds.

SEE POWELL EXHIBIT SPACE NO. 504, NATIONAL EXPOSITION OF POWER AND MECHANICAL ENGINEERING, DEC. 1 TO 6, 1924, GRAND CENTRAL PALACE, NEW YORK, N. Y.

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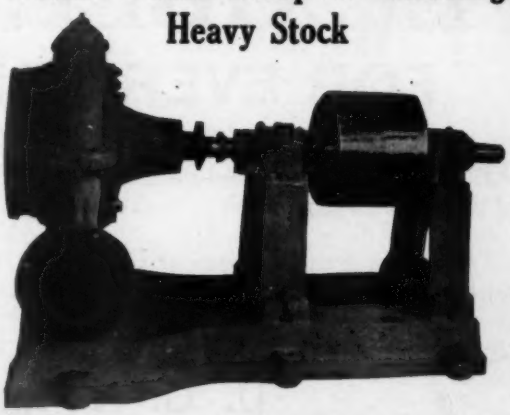

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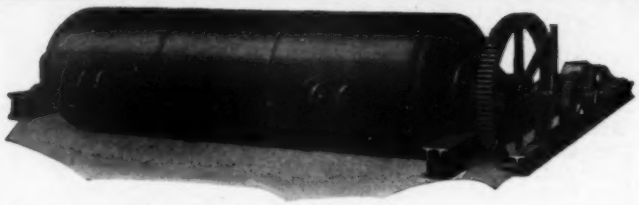

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including the

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for Short Center Belt Drives.

Special Machinery Built to Order

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General Electric Co.

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J. O. Ross Eng. Corp.
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John Waldron Corp.

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Hudson-Sharp Mach. Co.

AIR WASHERS
J. O. Ross Eng. Corp.

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The Mathieson Alkali Wks.
Solvay Process Co.

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Ferguson Engineers.
Hardy S. Ferguson.
George F. Hardy.
V. D. Simons.
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Schieren Co., Chas. A.

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Ingersoll-Rand Co. (A. S. Cameron Steam Pumps).
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Black-Clawson Co.

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Hamler Boiler & Tank Co.
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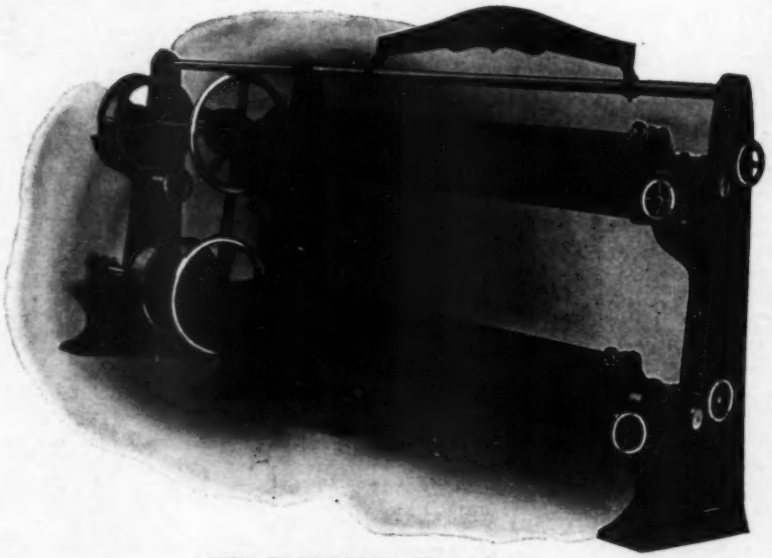

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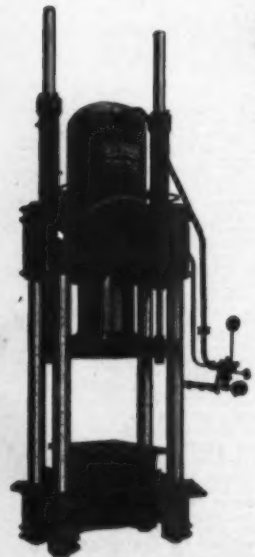
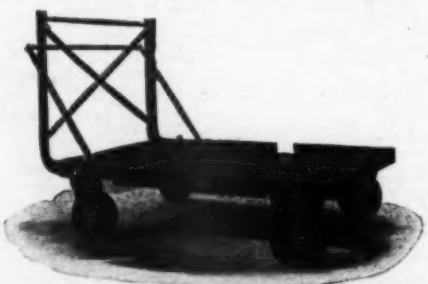


600 Ton Pulp Press



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Chandler & Taylor Co.
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Ferguson Engineers.
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Hill Clutch Mach. & Foundry Co.
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Moore and White Co.
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GEARS (Herringbone)
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GEARS (Rawhide)
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Reading Chain & Block Corp.
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Ingersoll-Rand Co. (A. S. Cameron Steam Pumps).

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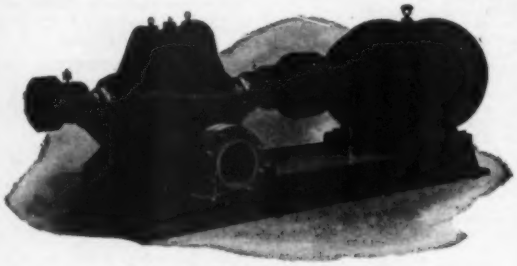

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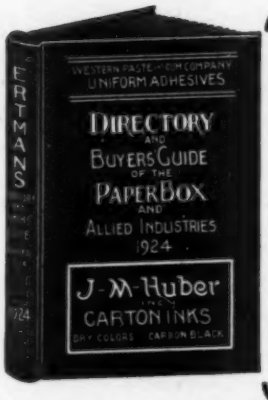

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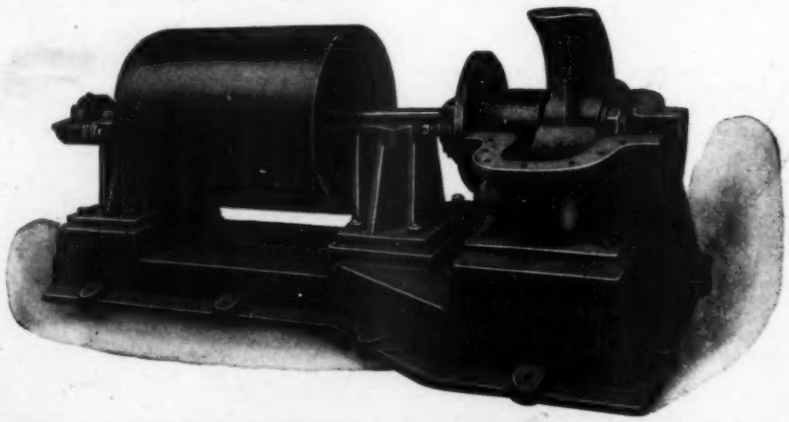

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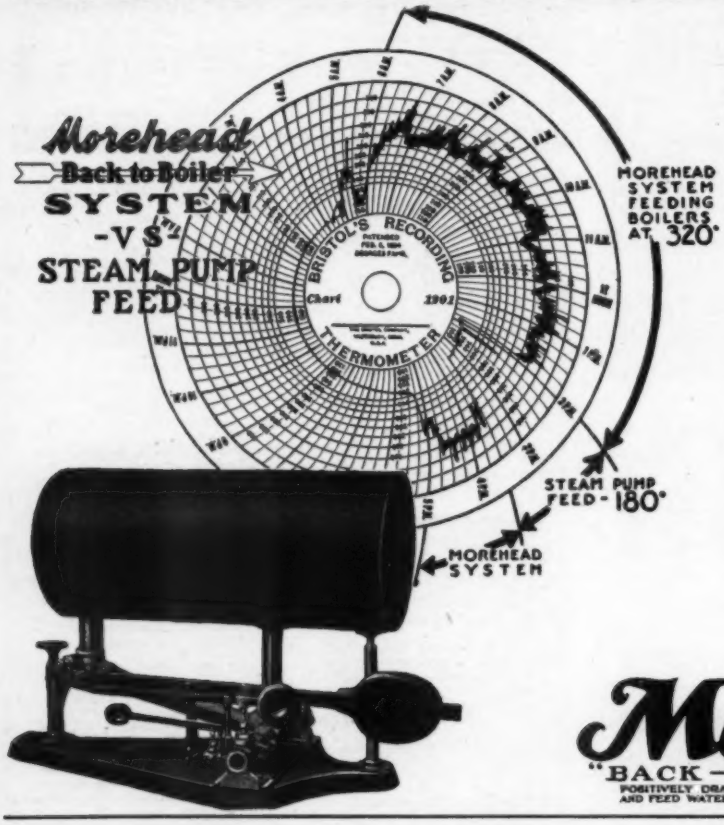

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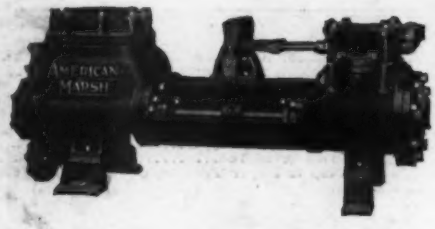

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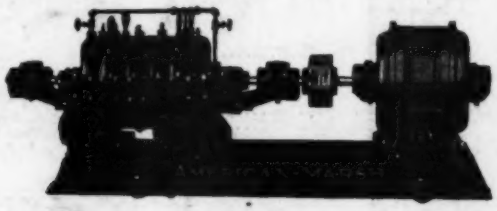

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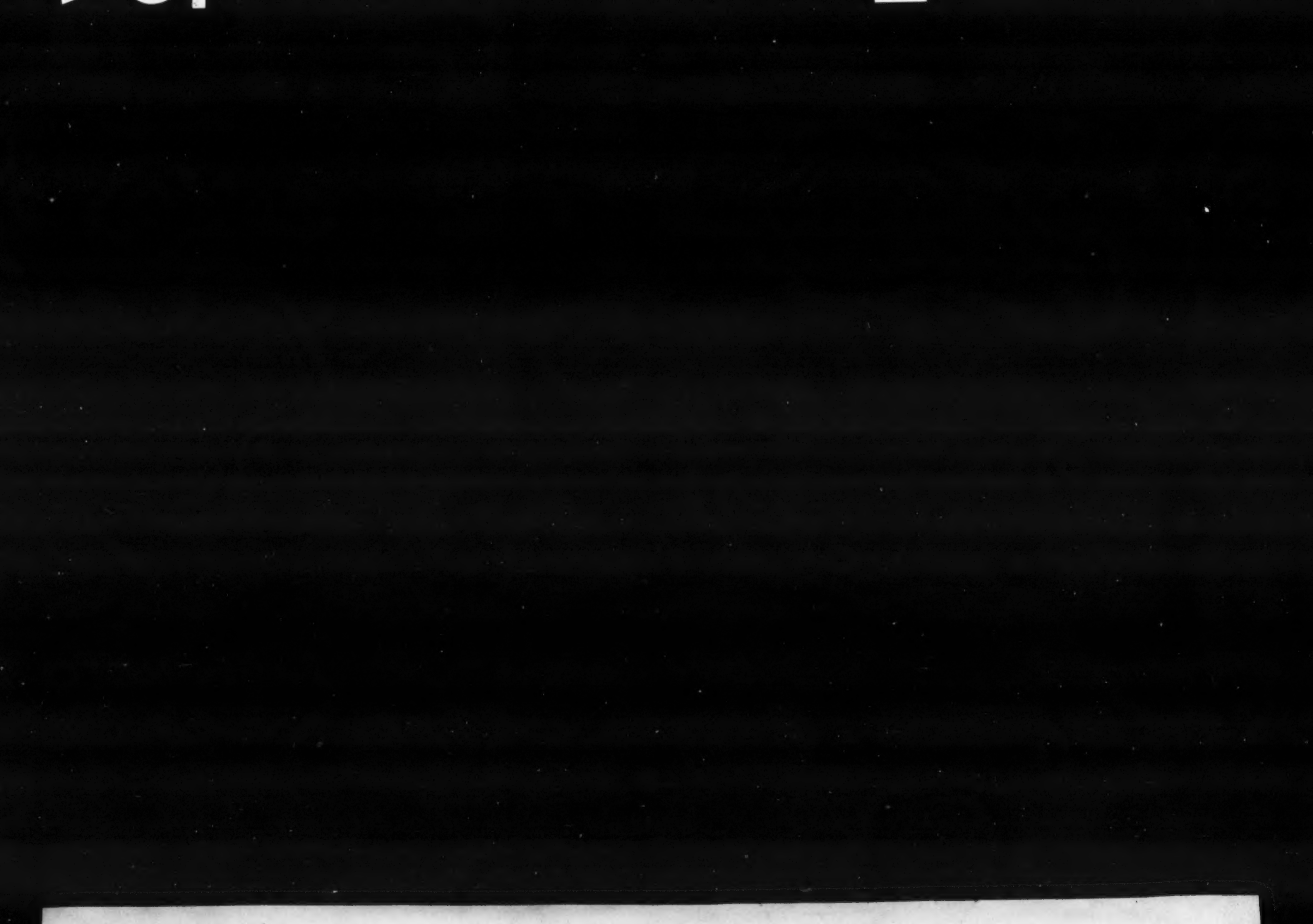
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